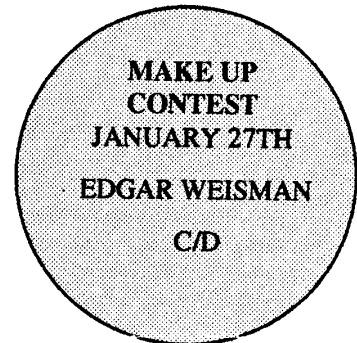


# T O S S - U P



## NEWSLETTER

JANUARY 1990 T.O.S.S. P.O. BOX 1955 THOUSAND OAKS, CA. 91362

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**Next Contest; FEB 10th 1990**

**C/D:** Chuck Griswold  
**Type:** 3,5,7, in out landing

**Next Meeting:** Jan 31st 1990

**Place:** Oaks Mall  
Next to Bullocks  
Hillcrest Dr. T.O.  
**Time** 7:30 p.m.



## Eric's Blurb

It's the day before Christmas and I decided if you all were going to hear from me this month I better get my column done before I head to Denver. I'm going to miss the January contest. So much for one throwout.

Congratulations, Joe for taking Flyer of the Year in 2Meter and Open. You certainly give us all something to shoot for.

Edgar has been working on a new field and I have been giving him support as needed. We got some good information from the AMA regarding the different agencies AMA National has been working with, which should be helpful to us.

Get your money in for the dues for this year. It is important to also fill out the signup sheet so everyone knows what frequency you are on. Don't keep it a secret.

The other day Chuck and I did an experiment out at the field. Chuck made a program to figure Reynolds Numbers. Without going into alot of detail, Reynolds number takes into account wing chord and airplane speed. All the data coming out of the Princeton Wind Tunnel show different L/D polars at varying Reynolds numbers. Both of us knew our wing chords (we can read a tape measure real well) but we could only estimate how fast we were flying our planes. So, out to the field we went early one morning. We measured off a tenth of a mile and I flew my new 100" Quabeck Bagged airplane and then Chuck flew his Prodigy. We flew laps a two different trim settings. One was set to the speed we would fly in thermals and the second was at a speed we would use to search for lift. We then took the times and converted them to miles per hour. Now we were able to use Chuck's program to figure Reynolds numbers. Chuck's Prodigy was flying in a range of 90,000 to 116,000 Reynolds numbers with a speed range of 17 to 22 mph and my plane had a Reynold number range of 148,000 to 195,000 with a speed range of 20 mph to 29 mph. What does all this mean? Beats me I just though I would throw it out there for consumption. One thing I can tell you is to now take a look at the

Princeton polars. They make a little more sense to me. One final note my X-C is flying somewhere in the range of 170,000 at thermal speed to 400,000 at 45 Mph.

On December 17, four TOSS member Ed Oldenburg, Art McNamee, Myles and myself went to Long Beach for the Toys for Tots Contest hosted be El Dorado Silent Flyers. What a great idea. My hat goes off to El Dorado. They got some good publicity for our sport and put on a great contest. I think more clubs need to show the community we can contribute not to mention the kids that got a toy for Xmas. Anyway El Dorado has a beautiful field in a huge City of Long Beach park. It is all grass with paved parking next to the field. Definitely first class. They had just about 40 flyers show up with a lot of first timers. It was their first attempt at a big contest and it came off well. There were 11 trophies in all with TOSS members bringing home 6 of them. Way to go TOSS. Myles carried home the Team trophy and Second Place in 2 Meter and Open, Ed brought home third place in Open and a Trophy for the best poker hand of the day. Everyone drew a card after they flew and Ed won with three Kings on the last card drawn. I won 2 meter using Ed's Pixy after I crashed my Rookie due to radio or interference problems. I suspect interference but I sent the whole mess to Airtronics to be checked out. Fortunately the plane wasn't hurt to bad and is back in the air after a days worth of work. Thank you Ed for letting me use your plane even though it doesn't land as well as my Rookie, but beggers can't be choosers. It was truely a team effort and a heck of a lot of fun.

Next month I'll do an article on the care and feeding of a winch and retriever. This is brought on by the El Dorado contest as many people don't know how to set up a system correctly. P. S. I fixed the brake on my winch Don. You'll love it.

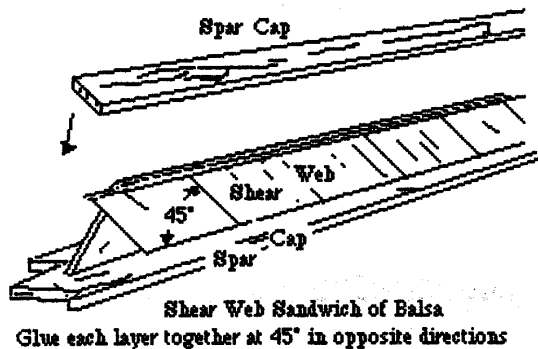
One final note, lots of new planes being built out there. Ed Oldenburg just bagged a RG15 Falcon in my garage. Can't wait to see it fly. Thats it for this month.

*Later, Eric*



**Tech Talk**  
**From Pasadena Soar Spots**  
**Roger Chastain**

Ever wonder why they call it Shear Webs? You know the wood between the spars in the wing. If you look at the way the grain of the wood is always oriented, you would think calling it a Compression Web would be more accurate. The grain is oriented for up and down loads. What really happens with the spars is that they try to move span wise relative to each other as well as in a compressive direction. My sketch below illustrates what I think would give better results not only structurally but also gives a better glue joint. Glueing end grain gives the weakest joint. Forty five degrees helps that problem.



**Yo;**  
**Wile - E Coyote !**  
**Check your "6"**  
**The Tasmanian Devil's on your**  
**tail**

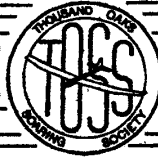
**C/D's For the Year**

Jan 13th	Ed Weisman
Feb 10th	Chuck Griswold
Mar 10th	Art McNamee
Apr 14th	Ed Oldenburg
May 12th	Eric Hendrickson
Jun 9th	???????
Jul 14th	???????
Aug 11th	Don Northern
Sept 8th	X/C
Oct 13th	Richard Hartman
Nov 10th	Ralph Morgan
Dec 8th	???????

**Soap Box**

Just a quickie. I already did my stuff in the "What the heck" category. I can't think of the guy that told me "I can barely keep mind and body attached when reading Soap Box." I don't know if that is good or bad. If he was trying to go to sleep might be the best thing for him.

Just got off the phone with Bob (the Real Bob) Onstad. Called to let me know that everything is OK in Arkansas. He joined TOSS for another year. Assured me that he is really very proud of the club. The one thing Bob misses are the contests. He has tried to start a club, but no takers. They'd be interested if their gliders would fly like his. They are all into the noise and oil type flying. Gliders and power don't mix. The winters in AR are a bit rough for the average flyer. The article in Model Builder got Bob's attention, its neat to belong to a winning club



Thanks to Joe- Jan Wurts, Don Vickers and group.

Any of you guys that are interested in electric power and if you would like to share the information, drop Bob a note and tell him what you have found out about electric power. He just wants to get his Slobod special up without the trouble of laying out the winch. Says the elements are hard on the string.

You might see a difference in the quality of type. I bought a neat printer for myself for Christmas. It's called a Hewlett Packard Desk Writer. Looks good don't it. Sorry to say the quality of the writing stayed the same. If I could buy a new brain for the same price, I'd go for it.

I run into some funny ideas about design philosophy every once in a while. So that's why you all are being subjected to the definitions. And since the club is going crazy cutting foam and fiber glass I thought we ought to at least know why we are cutting that twelve foot long three inch chord 4% thick wing. And why it takes us off at the ankles when it lands. Of course if you know all that and want to re-invent the wheel then good luck. Some article made mention of using fiberglass fuselages to increase performance. That, to me, is like using a two part epoxy paint. You can get a better finish. If you like the looks then go for it, its not going to win or loose the contest for you.

The contest got rained out last week. Let's make up a standard day "make up date." Like the following Saturday or the last Saturday or what ever. I think the 27th would be a good day this month. Seeing no opposition Edgar will do the honors. Next month its mine. We'll talk about it during the meeting this month.

*I quit  
Chuck*

TREASURERS REPORT

Checking account -----\$ 504.16

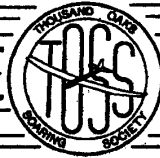
The  
Red Baron

Radio Control  
Model Hobbies  
77 Daily Drive  
Camarillo, CA.  
(805) 482-0250

WHAT TH'HECK'S HE  
TALKING BOUT?

Oft times, I sit and listen to the hot shoes talk about what you should do to shorten the bubble or lengthen the transition. Guess what? They're talking about model gliders!! Now don't that take all? So I got out my Martin Simons book, the one that Ed Old gave me for helping while he was President, and the new Soartech #8 that Herk Stokely sent me, and the Princeton paper that the Three Amigo's sent me back in 1985. With all this information floating around, I should be able to pop bubbles with the best of them.

Reading through all that stuff once, was pretty dry. Oh, on occasion the discussion would liven up a little and the plane would stall and I could see it spinning out of the sky in my minds eye. The excitement would build in direct proportion to the Reynolds number. But over all, after a couple of hours, I'd loose interest and so the chapters would be spaced over a few months, to say nothing of the books. (Not the best way to study and retain information)



Now I think it's time to put all this information in a very consolidated form ( something like "Go for it and rebuild later if necessary") I think it best to start out with a list of definitions. Terms defined in a rational order.

As the year progresses I might stick some more high tech stuff in here ifin yall don't laugh at the way I think about stuff like this.

**Reynolds number:**

$Rn = (\text{Density}/\text{Viscosity}) \times \text{Velocity} \times \text{Length}$  The density and viscosity of air are unchangeable for design purposes so—

$Rn = 6360 \times \text{Velocity in feet / sec.} \times \text{Length of cord in feet.}$   $88 \text{ feet / sec.} = 60 \text{ mph}$   $44 = 30$   $22 = 15 \text{ mph}$  etc. This will give you a Reynolds number compatible with polars you find in a tech manual.

*Visualize:* Sand on the surface of the wing.(air molecules) Count the grains on the wing over a period of time, more grains = better. The closer you come to flying like a real airplane. Less scale effect. You can only count more grains on the wing by increasing the speed or the chord. ¿Comprendo?

**Boundary Layer:**

The area between the airfoil surface and a point above or below the wing surface where the air has not been affected by the passage of the wing.

**Laminar:**

*Visualize* . Many sheets of thin paper stacked layer upon layer above the wing. Each layer is moving slower in relation to the wing than he one above it until the closest layer to the surface is moving at the same speed as the wing. Same for the bottom. This is a low drag condition and preferable over a turbulent layer. Except for the fact that laminar flow separates sooner and reattaches much later if at all.

**For Laminar Flow :**

Low drag. Thus higher efficiency.

**Against Laminar Flow :**

Very easy to detach from surface. Much harder to re-attach.

**Bubbles:**

The boundary layer becomes detached,

usually at the lower pressure regions, ( you know, at the thickest part of the wing, the part where most lift is produced. Just think of the lift pulling the sheets of paper off the surface) and at the laminar flow area at the leading edge, then reattaches down stream of that point. This stagnant area is called a bubble and increases drag dramatically. Just like gluing a hunk of balsa to the top of the wing. The air molecules don't move off the wing in this area. As the angle of attack continues to increase, after a bubble has formed, the bubble breaks, the boundary layer cannot reattach, and a stall occurs.

**Attached:**

The boundary layer stays on the surface or parallel to it.

**Detached:**

The boundary layer becomes separated from the surface of the wing. The boundary layer may become detached at a point and then reattach itself (forming a bubble) or it may never reattach. Causing very high drag or possibly a stall

**Turbulent:**

*Visualize* Very fine sand tumbling grain over grain along the length of the airfoil. A rolling motion. Always thicker than laminar flow.

**For Turbulent flow:**

Sticks to the surface longer. Harder to detach completely from the surface.

**Against Turbulent flow:**

Higher drag than laminar flow.

**Transition Zone:**

The area where the boundary layer goes from laminar to turbulent. Or where the flow detaches completely

**Ramps:**

Are designed into airfoils to help the boundary layer stay attached longer or help it reattach after



the bubble has formed. With low  $R_n$  like ours the ramps are designed to cover most of the upper surface of the airfoil. So don't look for one, chances are you won't find it.

**Hysteresis :**

(phys) Failure of a property changed by an external agent to return to its original value when the cause of the change is removed.

*high lift* Hysteresis (Princeton papers.)

*Visualize* an airfoil increasing its angle of attack (aoa) to a point right before a stall. Mark that point in your mind now increase the angle of attack just a bit more and get the stall. Now recover, as you decrease the aoa the airfoil must drop below the mark (in your mind's eye) before it has recovered and is again flying. This is high lift hysteresis, or leading edge stall. The bubble breaks right on the leading edge.

*moderate lift* Hysteresis (Princeton papers)

*Visualize* an airfoil increasing the aoa as the first one did. Before it reaches the stall it seems to slow down the drag increases and you would swear that someone had deployed your spoilers. Although if you continue to pull in more up trim it starts to look promising. The aoa increases slightly and we're flying again. A little more up trim and it's stall time. Just as in the first example the old bubble formed but this time it reattached toward the trailing edge, long bubble, causing a high drag condition. Then as you increased the aoa the trailing edge of the bubble started forward again and drag dropped off. Now since a little was good a bit more must be better. Wrong. Back to the high speed hysteresis and leading edge stall. Why would anyone fly a plane like that? How many of you have flown the E-205. "Sagitta" Any one say, "Hey buddy, you got to fly that plane fast, on the step" Then someone thought, maybe if you put a turbulator on it you don't have to scream around the sky. He's right! Of course the idea of Eppler's airfoils is to keep them laminar longer and cut down on drag. Well the best laid plans— etc etc!

**Turbulators: (trips)**

Turbulators trip up the laminar flow and start the sand rolling over the surface of the wing. This raises the drag a bit but keeps the boundary layer on the surface longer and keeps the dreaded bubble from forming as soon. On full sized aircraft the flow is seldom laminar. The Reynolds numbers are so high that any panel line or rivet will start turbulent flow. On R/C gliders with Reynolds numbers below 1 million the air appears more viscous and therefore remains laminar over larger imperfections. To turbulate a piece of trim tape will usually do the trick. (.010" by 1/8")

Ok, if I haven't bored you to tears, think about this for a while. Its goin to take me a while to think up some more of this high tech stuff. I just listened to the C/O of the Top Gun squadron at Miramar try to explain "G" forces on the program "Wings". I don't feel so bad any more. Of course, just scream and hollar if you can't take it, I promise I'll stop.

*Bye  
Chuck*

**LET'S KEEP IN MIND ITS DUES TIME AGAIN. FEBRUARY IS THE LAST NEWSLETTER FOR NON PAYING NON MEMBERS.**

**HEY! MARTHA, WE DON'T HAVE TO LISTEN TO THAT JERK ANYMORE, JUST DON'T SEND HIM A CHECK.**



# League of Silent Flight

P.O. Box 517  
Winfield, Illinois 60190 USA

To: LSF Executive Board  
P.O. Box 517  
Winfield, Illinois 60190

I, \_\_\_\_\_ (please print), will support the philosophies, concepts and criteria set forth in the Bylaws of THE LEAGUE OF SILENT FLIGHT and give notice herewith of intention to attain Level 1 of the Accomplishments Program, and by so doing earn full recognition and privilege of membership.

\_\_\_\_\_  
(Signature)

Mailing Address: \_\_\_\_\_

AMA (or other FAI Affiliate) Licence or Membership No. \_\_\_\_\_

Note: ALL CORRESPONDENCE TO THE LSF MUST INCLUDE AT LEAST \$1.00 IN US STAMPS OR CHECK / M.O. FOR POSTAGE

