CHAPTER 42 NEWSLETTER

March, 2006 Anchorage, Alaska

Monthly newsletter from Chapter 42 of the Experimental Aircraft Association

FROM THE LEFT SEAT

The Vernal Equinox (the equinoxes are the two days each year when the middle of the sun is an equal amount of time above and below the horizon for every location on Earth) has finally arrived, and yes, there is an end to this long cold winter. I don't know about you but it has felt a little colder than normal to me this winter. But the weather climate data doesn't support that feeling. When I research the trends I find that the daily lows have been lower than normal but the daily highs are right on track.

March, perhaps, has more folklore associated with it than any other month and a good question would be, "why?" Perhaps it is because it is the month where the weather is oftentimes the most rambunctious, with winter trying to hold on and spring trying to appear.

The origins of old folk tales like "In like a lion, out like a lamb" have been lost through the centuries.

In Like A Lion, Out Like A Lamb
By Lorie Hill

March roars in like a lion
So fierce,
The wind so cold,
It seems to pierce.
The month rolls on
And Spring draws near,
And March goes out
Like a lamb so dear.

It was pretty cold for us in Anchorage at the begining of March so perhaps our March will end up being nice and balmy.

Another old saying is, "Climate is what you expect, weather is what you get."

We have another great monthly meeting scheduled for the 28th of March, 7 PM. Look inside this month's newsletter or on the website for more information. We hope that you can make it. Many thanks to Jack Brown for organizing this event, which I am certain will be informative and interesting.

Last Saturday's monthly breakfast get together was just as good as the first one. I had an Alaskan omelet and pancakes; if this keeps up I will have to build a bigger airplane in order to haul my increased gross weight. But all kidding aside, the food was good, the conversation was better and we are going to do it again next month.

The chapter is about to experience some first flights and you can expect to hear more about them in the near future. Our fellow chapter members are a little shy about having an audience for the first flight but perhaps once they get a couple of take-offs and landings under their belts, they will invite us out for a look and see.

Hope you are building or flying or dreaming about flying and building. See you at the meeting.

Mike

NEXT MEETING

Our next meeting will be Tues, March 28th 7pm. Jack Brown has arranged for us to get a tour of the Alaska Aviation Heritage Museum. The museum is located on Lake Hood on the south side. Their web site can be found at home.gci.net/~aahm/index.html. Driving instructions are shown below.

When going toward the airport on International Airport Road, take the turnoff toward the North (International) Terminal on Postmark Drive. Take the next right on Heliport Drive. Take an immediate right and follow the aircraft taxiway until you reach the museum. Go between Rust's Flying Service and the Museum and park by the lake. The entrance is on the lake. You will see brown signs along the way saying "Air Museum."

This should be another great meeting. See you there.

There will be a Stitts workshop in Anchorage on April 22-23. The cost is $240.00, and it will be held at Consolidated Body Works in Anchorage. John Goldenbon, the owner of Polyfiber, will be coming up for this workshop. They are looking for a few more people to hold the workshop. Contact Pete at 276-2046 to register.

DIMPLES AND DRAG by Mike Ice

Can you explain why a golf ball has dimples? If dimples reduce drag, why don't we see this surface feature on other aerodynamic shapes like airplane wings?

Before explaining the purpose of dimples, we first need to understand the aerodynamic properties of a sphere. If we lived in an ideal world without any friction, the air flowing around a smooth sphere would form a perfectly symmetrical pattern.

Reynolds number (Re) is an important non-dimensional parameter that is used to relate the size of an object to the flow conditions it experiences, and is defined by the equation where

r = atmospheric density
V_∞ = velocity
l = reference length (in the case of a sphere, this variable is defined as the diameter)
m = viscosity (or friction)

In other words, any two spheres that experience the same Reynolds number should exhibit the same aerodynamic characteristics even if the spheres are of different sizes or flying at different speeds.

One of the key factors affecting flow separation is the behavior of the boundary layer. The boundary layer is a thin layer of air that lies very close to the surface of a body in motion. It is within this layer that the adverse pressure gradient develops that causes the airflow to separate from the surface.

At low Reynolds numbers, the boundary layer remains very smooth and is called laminar. Laminar boundary layers are normally very desirable because they reduce drag on most shapes. Unfortunately, laminar boundary layers are also very fragile and separate from the surface of a body very easily.

Since the laminar boundary layer around the smooth sphere separates so rapidly, it creates a very large wake over the entire rear face. This large wake maximizes the region of low pressure and, therefore, creates a large drag.

The transition to a turbulent boundary layer, on the other hand, adds energy to the flow allowing it to remain attached to the surface of the sphere further aft. Since separation is delayed, the resulting wake is much narrower

These results tell us that causing a turbulent boundary layer to form on the front surface significantly reduces the sphere's drag. For a given sphere diameter, a designer has only two options to encourage this transition, either 1) increase the speed of the flow over the sphere to increase the Reynolds number beyond transition, or 2) make the surface rough in order to create turbulence. The latter case is often referred to as "tripping" the boundary layer.

In the case of a golf ball, increasing the speed is not an option since a golfer can only swing the club so fast. That leaves tripping the boundary layer as the only realistic alternative to reducing the drag on a golf ball. The purpose of the dimples is to do just that--to create a rough surface that promotes an early transition to a turbulent boundary layer. When the drag is reduced, the ball flies farther.

The reason we do not see dimples on other shapes, like wings, is that these particular forms of boundary layer trips only work well on a blunt body like a sphere or a cylinder. More streamlined shapes like the airfoils used on wings are dominated by a different kind of drag called skin friction drag.

However, there do exist other types of devices commonly used on wings that create a similar effect to the dimples used on golf balls. Though these wing devices also create turbulence in order to delay flow separation, the purpose is not to decrease drag but to increase lift. One of the most popular of these devices is the vortex generator. Vortex generators are truly amazing devices but we will leave that subject for another time.

The above information was gleaned from an article named *Golf Ball Dimples & Drag* , published by www.Aerospaceweb.org.

UNDERWATER EGRESS by Burke Wick

There is only one way to put it. Underwater egress training saved my life and the life of my wife. My wife and I were involved in a floatplane incident. The plane impacted the water, flipped over and sank immediately.

Several years ago I had the opportunity to take an underwater egress training program that was offered locally by the Coast Guard and the FAA. The training consisted of a classroom session and pool session. The instructors tried to convey to the group attending that winding up in the water in an aircraft was very disorienting and frightening. I cannot tell you what an understatement this is. All of your senses are running in overdrive. The noise of the impact is ringing in your ears. Anything that was loose in the cockpit is flying around. You cannot see. The other person in the plane might be panicking a little and grabbing and pulling on you. Now you're upside down without a chance to take a breath before you went under.

The instructors attempted to convey all of this. They stressed the importance of having a reference point and focusing on it and here is the hard part…waiting so that your actions can have a chance of succeeding. It does no good to push on the door until the plane is completely flooded; it won't move.

I remembered all of this at the moment that it counted. As

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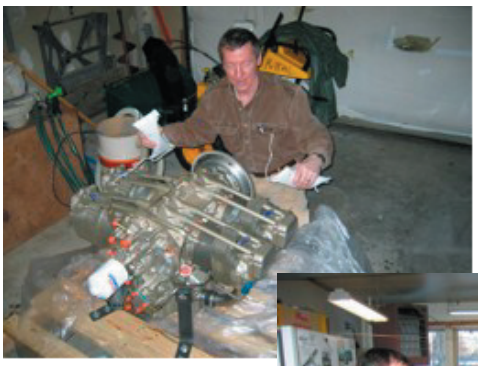
TECHNICAL ADVISOR VISITS by Cliff Belleau

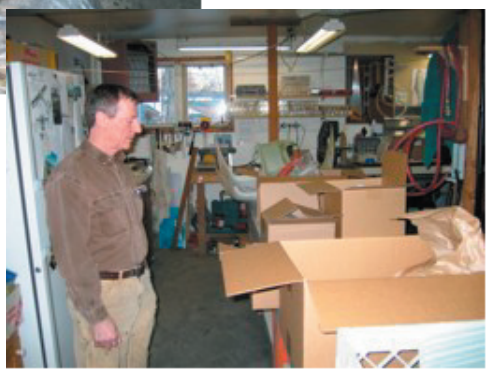
I recently had the privilege of being invited to view Tim Rittal's GlaStar project. Tim has made excellent progress on his "slow build" kit. He has completed building the major structural components. The workmanship is very good. He has just taken delivery of his engine and begun the installation process. He is 90% done with 50% to go.

The GlaStar is a two seat strut braced high wing monoplane. The designed engine is a Lycoming O290, O320 or O360 of from 125 to 180 HP. The aircraft can be converted from tricycle to conventional gear (tail dragger) without any structural modifications. Both sets of attach points are included in the fuselage structure. Floats are an option. There is a 2+2 version for two adults and two children.

The GlaStar series is manufactured by GlaStar Aviation and have the reputation of being very well detailed and complete kits with good documentation. They have a very detailed website (www.glasairaviation.com) with specifications of each model and links to builder's websites and builder's groups.



Tim Rittal opening the big $$$$ present, Aero Sport Power 0-360 180hp



Boxes and boxes of stuff, all goes under the engine cowling

On March 15, I had the privilege of viewing Tim Coalwell's Zenith CH801 project. When I first visited him in February of 2004, Tim had just gotten started on his kit, and was building the empennage. He has since completed the horizontal stabilizer, flaperons, leading edge slats, and has both wings substantially completed. At this visit he is well along on the fuselage construction with some of the flight controls installed. He is currently fitting the main gear spring. The construction uses a mix of standard driven MS20470AD rivets and Avex blind fasteners. The driven rivets are installed by the factory. With a pneumatic rivet puller the builder can make rapid progress in assembling the structure. I have included some photo's of Tim's nice work.

The CH801 is a four seat strut braced high wing monoplane. The designed engine is an O-360 Lycoming, as opposed to the Rotax used on its little brother, the CH701 two place of almost identical design. The plans appear to be very well detailed and are clearly drawn on a CAD program. The Zenith website is www.zenithair.com with photos of the aircraft and an article about STOL aircraft design that I found interesting. There are rumored to be at least two of these flying in Alaska at this time with more on the way.

Tim has done a nice job of the work. He is priming all of the parts with an epoxy primer prior to assembly. He is making great progress at a quick pace. I expect he will be close to completion of all the major components by spring.

Tim has offered to share his experience with this kit with others. You may contact him at coalwellt@aol.com.

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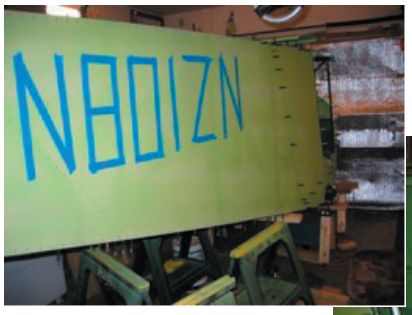
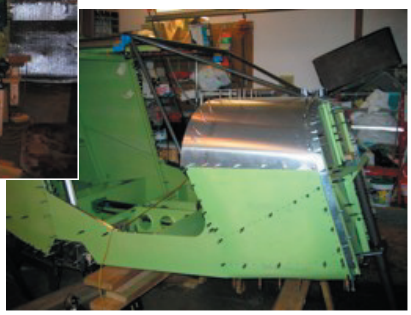
MONTHLY MEETINGS	4th Tuesday of most months



Tim Coalwell's Zenith CH801



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EAA Chapter 42
Monthly Breakfast
2nd Saturday of each month
Village Inn on Spenard Road
10am

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my head went under water, I was able to grab my reference point, which happens to be the top latch on the door (my aircraft had two latches on the door). As the plane rolled, I released my harness and grabbed the other door latch. I was then able to push the door open and get out. My wife (who had not had the training) was disoriented and trying to get out the side of the plane with no door. I was able to grab the back of her survival vest and pull her out of the plane backwards. We were not able to retrieve our small dog from the wreck and suspect that she was killed on impact. Witnesses on shore said that this all took about 30 seconds. I have no idea how long it took. Another floatplane came to our aid within about 4 minutes. You know who you are…saying thank you is not enough.

If you fly in Alaska on floats or wheels for that matter, I cannot stress strongly enough how important underwater egress training is. I absolutely believe that if one of us had not had the training that we would not have survived the event. If you haven't taken it, take it. If you have taken it…take it again. I know I will…and so will my wife.

One last thing, wear an inflatable floatation vest such as a Sterns with critical survival gear in the pockets. You can only count on getting out of the plane with what you are wearing. Any survival gear in the cargo compartment is just camping gear and it will sink with the plane.

And a big thank you to all the FAA and Coast Guard people and the Alaskan Aviation Safety Foundation who put this training on. I know of two lives you can take credit for saving.

An egress training schedule for Anchorage will be noticed at www.faasafety.gov/; so check out the site to sign up for it.

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