THE KNIGHT FLYER

Jul—Aug—Sept 2009
Editor Jim Devlin

Picnic Kick Starts Summer

The yellow biplane passed over the shelter and made a graceful turn around the south end of the North Collins field. It was shortly after noon and the parking lot was not particularly full. Many empty spaces remained.

On the field there was very little activity. About a half dozen planes were arranged on the flight line.

Bob Soboleski dropped the biplane down gently in front of the flight station.

The weather was perfect for a picnic and as the afternoon rolled along, the parking lot and the flight line filled up.

The June picnic was very successful and all who attended, enjoyed hot dogs cooked up by Chuck Caruana and son Chris. As usual, there was plenty to eat.

Our summer picnics have proven to be a popular venue.

Each month the club hosts the picnic at the North Collins field. the club supplies the hot dogs and the pop, while members who attend bring a dish to pass.

Geezer Gallery

Chris Caruana fires up his Cub.

Gerry Piscatello flew his new Long Easy canard to everyone's delight.

By the middle of the afternoon, the flock of planes swelled to more than a dozen.

Of course, the club relies upon volunteers to do the cooking for the afternoon dinner. Usually two people will take on the responsibility for this task.

This activity should be shared among all of the club members.

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Inside...

Sound Bytes

There are two ways to look at noise.

First, noise has a certain **intensity**.

This is easily measured and laws can be made to codify it.

The second way is the **kind** of noise. This is a personal issue and for some, the only issue.

This could be a dog barking, a baby crying, or in our instance, a model airplane engine. People who dislike model airplanes will scream at the sound of a glider!

The problem here is that neither technology nor laws can be easily used to prevent or control what folks like or don't like.

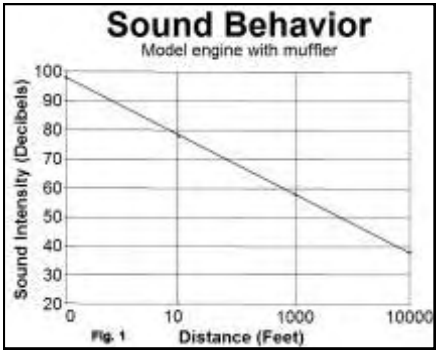

Fig. 1

Intensity of sound follows well known physical laws.

As sound travels it diminishes with the square of the distance.

This is a **logarithmic** behavior so it is measured in a log scale such as **decibels**.

Sound decreases 6 decibels for each doubling of the distance or 6 dB per octave. This is the same as 20 dB per decade. A decade is a **power of ten**.

In other words if you multiply the distance by 10 (a decade), the sound will decrease by 20 decibels. This is shown in fig.1.

Measuring the source at 10 feet, makes this a snap.

The next decade is 100 feet, the following decade is 1000 ft.

Obviously, the next decade is 10,000 ft or about 2 miles.

Now, we have a straight line that provides us with any intensity in between. Is that cool or what?

The sound produced by an unmuffled model engine is between 100 and 110 dB at 10 feet.

With a 12 dB muffler, 110 dB is reduced to 98 dB at the same 10 ft. distance.

Now apply the "20 dB / decade" law. Just subtract 20 dB.

At 100 feet, the sound is reduced to 78 dB. This is below most commercial zoning requirements.

At 1000 feet (about 1/4 mile), the level is 58 dB, about as loud as normal speech. Moving out to 10,000 feet, (approx 2 miles) the sound level is cut to 38 dB.

This is the same as a quiet neighborhood, as Fig.2 shows.

It is easy to draw a perimeter around a flying field and simply calculate the intensity at chosen distances.

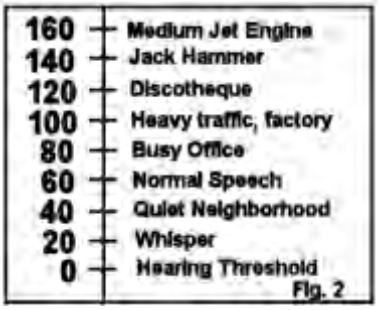

Fig. 2

Sounds also mix together, both adding and subtracting.

So the sound intensity remains the same for multiple planes.

Allowing any Dick or Jane to establish regulations based on what they "feel" or happen to "like" is not only bad policy. It is also bad law.

We should work to establish well defined noise levels around our flying fields and encourage town boards to apply the **rules of science** to undergird the making of laws and statutes.

Continued from page 1, Picnic.

Recently, it appeared that the same people were always doing the cooking, which tends to be unfair, since all members generally attend the picnics.

Gerry and Bob look over the Long Easy

The assignment should never rise to the level where the club president has to beg people to volunteer for this activity.

There is a bit of work involved in the task. Normally two people handle the cooking and the transport of the supplies.

If volunteers come forward in pairs, the work is greatly minimized..

If no one signs up to handle the cooking for future picnics, they will simply be cancelled.

There are three more picnics scheduled for this summer, so if we are to continue to have picnics, someone is going to have to step up to the plate.

Blessed with perfect weather, the June picnic was a splendid success.

Hopefully the tradition will continue and the rest of the summer's picnics will take place on schedule.

The only unknown factor should be the weather, so let's hope that June sets the standard for the picnics to come.

Hamburg Paper Reports on Town Board Meeting

The Hamburg Sun carried an article by their correspondent, David Dahl, regarding our request to operate a new model airplane facility in the town of Boston on County owned land.

This land according to the article is part of a 720 acre parcel known as the Boston Forest. The club would use a 750 foot by 2000 ft area, about 34.5 acres, (about 4.5 percent) of the land for purely recreational purposes.

Residents questioned why the club needs to use government owned land, suggesting that the club lease or buy land. The club is a non-profit recreational entity.

Government, (local, state and federal) provide many recreational venues for the tax paying citizens. Evangola State Park (swimming), chestnut Ridge (hiking & picnicking) and even the Nike Site (soccer) in Hamburg come to mind. And countless little league, golf and football teams use town property.

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Unidentified Flying Object

Every once in a while, a strange sighting occurs at the field or in one of our meetings.

On the evening of June 12th, this creature wandered into our meeting.

Actually the unusual chapeau was presented to our Prez by new member Fran Pompei in appreciation for all the help he received.

The Aerodynamic Stall

Lift is the magic force that keeps an airplane in the air. When lift goes, the plane falls.

It is a phenomenon that is familiar to every pilot.

It makes little difference whether we talk about a large airliner or a model, the effect is the same.

Most modelers have experienced one at some point in their pursuit of the hobby.

As a model flyer we don't see the conditions that lead to a stall. The model pilot is outside the plane, relying only on eye contact.

He has a "feel" for the airspeed and a good handle on altitude, but no device to measure these important quantities.

Inside the plane the cues are more evident, though not always, particularly under IFR, (Instrument flying rules).

However, even under these conditions, the pilot has his instruments to provide awareness of flight conditions.

The aerodynamic stall has recently been in the news as a result of the tragic crash of Flight 3409 in Clarence. We'll examine that later.

So, what is a stall?

What is the science behind the stall?

Like all phenomena in nature, the event happens. Science only describes the event.

Mathematics is the language used by science. This means that we can use the Lift Equation to describe the aerodynamic stall.

The Lift Equation is fairly simple. It consists of four parts.

These parts are the wing geometry, the air density, (a factor based on the planes attitude) and finally the airplane velocity.

Each of these factors will be influenced by the aircraft and the flight conditions.

The lifting surface is unique to each aircraft type.

Generally this is the wing. The wing can have a variety of shapes.

The wing area in sq- ft is the length times the width. This works nicely for rectangular wings but oddball shapes would require the use of calculus to accurately compute the area.

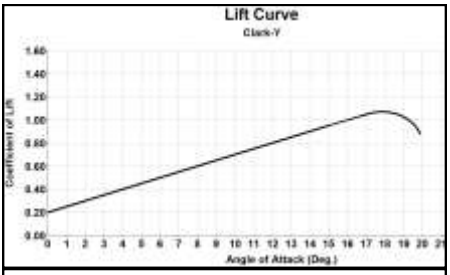

Fig. 1 Typical Lift Curve

The "coefficient of lift" is a dimensionless number that varies from zero to about two. It can be negative , (providing no lift).

It is usually plotted against the attack angle, the angle at which the wing moves through the air. See fig. 1.

This number not only represents the attack angle of the wing but also incorporates a variety of lift factors such as chord shape, flaps, slats etc.

It is derived for a specific wing from wind tunnel tests. This is a very important number.

The density of the air is a constant at a given altitude. It is given by the number .0024/2, (.0012) at sea level.

Finally, the velocity of the aircraft. This factor is very important because it varies as the **square**.

This means that if the speed doubles, the effect will increase by four times.

Putting them all together we have: $L=Cl*r/2*S*V^2$, the well known lift equation.

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Let's take one of our models, a Standard Trainer, Fig 1.

It's wing is 6 ft x .9 ft or 7.2 Sq ft.

The coefficient of lift is nominally .8 on approach due to the higher attack angle when landing.

We also fly fairly close to sea level. (Hamburg is approx. 700 feet above sea level). So we can use the standard value without too much error.

The weight of our model is about 6 to 8 pounds. That is the amount of lift that must be generated to keep it flying.

Fig. 2 Trainer

We can solve the equation for the velocity required to maintain flight.

Using a spreadsheet allows us to compute the lift as a function of speed. This is shown in Fig. 3.

As you can see, flight only becomes possible when the lift exceeds the weight.

At any speed below that value, lift is impossible and the plane simply tumbles to the ground.

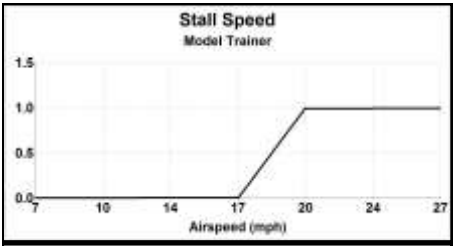

Fig.3 Trainer Stall Speed

This occurs with any plane , real or model.

A plane such as the Bombardier Q400, Fig.4, that crashed in Clarence , NY in February allegedly due to a stall is no different.

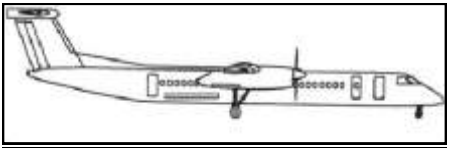

Fig.4 Bombardier Q-400

Using the same equation, we find its stall speed to be similar to that shown in Fig 3.

Wing area is 679 sq-ft and the weight loaded is 57,000 lbs.

The subtle aspect of this particular event is that ice buildup on the wings may have changed the critical "Coeff of lift" factor.

This factor represents the efficiency of the lifting surface.

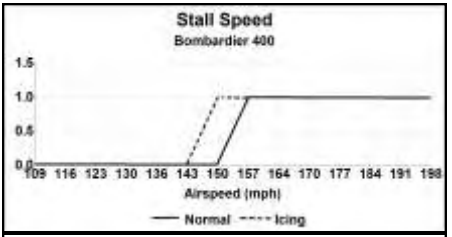

Fig. 5 Bombardier Stall Speed

It's effect would be to raise the actual stall speed of the wing by making the wing less efficient.

The plane would have stalled at a slightly higher speed than expected as shown in Fig. 5.

For example, if a normal stall speed of the Q400 is 150 mph as shown in the graph, the effect of icing could have changed that speed to 160 mph.

This is a very small shift in the efficiency of the wing, but the effect is critical.

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FLYING SEASON INSTRUCTORS

Call to set up possible day and time.

At the Nike Base:

John Newman	————	824 -5744
Bill Eberhardt	————	627-3486
Dave Savini	————	289-2031
Bill Hauth	————	649-8582
Jim Devlin	Wed. A.M.	627-7221

At North Collins:

Chuck Caruana	————	337-0144
George Fox	————	648-0667

Exciting Summer Day Trips

STARS Rally & Dist. II Fly-in,
Jul 18-19 Olean, NY.
Sky Rovers Air Show,
Jul 25-26 Phelps, NY.
Flying Knights Scale Rally,
Aug 1-2 Hamburg, NY.
R.C.C.R. Great Electric Fly,
Aug 15-16 Brockport, NY.
Stars Open House,
Aug 29-30 Cuba, NY.
Chiefs Camp & Fly,
Sep 5-6-7 Canadaigua, NY.
Flying Dutchman Scale Rally,
Sep 12-13 Kitchener, Ont.

Continued from page 5, Stall.

If the plane was approaching at 165 mph (well above the normal stall speed), simply dropping the wheels (with increased drag), would have slowed the plane to 155 mph.

This would still be within the normal range, where the pilot would have expected it to be. However, with the "reduced efficiency" due to icing it is clear that the actual speed would be below the normal stall speed.

Totally unexpected!

Airplanes, whether models or full scale, ruthlessly follow the laws of aerodynamics.

These laws are expressed in mathematical equations.

The Lift Equation is a tool that can be used to analyze the behavior of our models as well as full scale aircraft.

Knight's member, part of U. B design team.

Cessna Aircraft Co. and Raytheon Missile Systems present a challenge to University students each year.

For the last two years, Knight's member Andrew Hutchinson has participated as a student at the University of Buffalo.

Mission objectives were to fly a high drag payload, a simulated external tank for endurance and an asymmetric load of simulated missiles.

The team had to design for a minimum weight in a constrained geometry and were timed on aircraft readiness. This year, the event was held at Tucson, Arizona on April 17-19th.

U.B. plane readies for take off

Some 54 teams, approximately 600 students and faculty competed in near ideal weather.

The contest was won by Oklahoma State and The University of SC.

The UB entry, named the Deadalus made a successful flight but could not garner enough points to beat the top entries.

New Members Solo

During the spring several new members have achieved the pinnacle of independence. They have managed a "solo" flight.

This is a major milestone in the hobby. It means that now one can go out to the flying field without an instructor and have faith that they will bring an intact plane back home again.

This spring, three members attained this lofty goal.

They were, Chris Caruana, Herb Paas and Fran Pompei. The club congratulates them on their achievement.

Chris Caruana

Fran Pompei

Herb Paas

continued from page 3, Hamburg Sun

The article quoted a pig farmer who said he would like 40 acres of county property to raise hogs. There is not a single instance of anyone using county government land for a commercial enterprise. Nor should there be.

Recreation-**yes.** Private or commercial-**no**.

The noise question was settled on anecdotal grounds, as no actual data was provided by anyone that would quantify what noise, if any, would be heard at the perimeter of this block of land.

With muffler rules and the isolated location of the site, the noise problem may even be a non-problem.

The article was disappointing for all of the model clubs in the Western New York area who open their doors to youth, adult and senior citizens for recreational activity.

According to the Sun article, a decision appears to have been made based upon negligible evidence, little hard science and public/private land use confusion.

KNIGHT'S SWAP SHEET

If you have something for sale, or you are looking for something special, put your request in "The Swap Sheet". Free to all club members.

Call, email or write to Jim Devlin, editor with the specifics.
5761 Diana lane, Lake View, NY 14085
jndevlin@verizon.net

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