

It is with a deep sense of regret that we note the loss of a fellow Flying Knight.

James A. Biro passed away in early June.

Jim was an avid woodworker as well as possessing a keen interest in flying.

Our condolences go out to his family.

Annual Fall Auction

**September
25,1999**

Trinity Lutheran School gym

**145 Reserve Rd
West Seneca**

**Doors 11 am
Auction 1 pm
Admission \$3.00
Women & Children
Free**

**10% Commission-\$10
Max
10% Buy Back-\$5 Max**

If you have a computer, check out our Web Page at :

www2.froggernet.com/wizvend

You'll find many links to various clubs around the world.

Learning to Fly

Usually an individual buys a plane because he or she has an intense interest in aviation. When it comes to flying it, they seldom perceive the extent of "skill" required (we've all been there).

Often they opt to try it themselves. Sure, one or two rare individuals can accomplish this goal without help but usually with a lot of luck and one or two airplanes.

Without sound advice along the way, this is a prescription for disaster. The problem is that the combination of an untrained pilot and an untrimmed plane is an accident waiting to happen. Hopefully they will seek out a club or at least an experienced pilot.

For many years the Flying Knights have tried to make it easy for new members to become proficient in the skill of flying model aircraft.

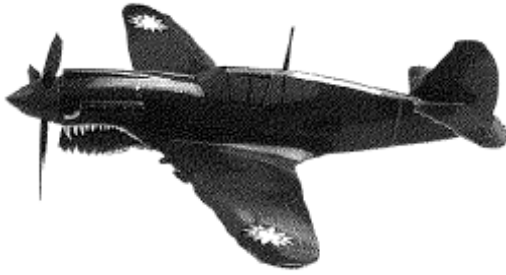
Between dedicated meetings and a cadre of instructors we hope that the new member finds everything that he needs in order to learn how to build and fly his pride and joy.

Several programs are in place in order to accomplish this goal.

First, our **new pilot committee**, in 3 special sessions, will introduce the new member to safety issues, club/field rules and discuss the how and why of selecting and building a first model or assist him with a model already started.

Secondly, the club encourages proficient flyers to become instructors. These dedicated members are always ready, willing and able to

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Scale Rally coming up!

Once again, our major show is upon us. A lot of help will be needed to make it a success.

Even though, a lot of effort is necessary to get it all together, it should be looked upon as fun day in the company of a lot of neat airplanes and mixing it up with a lot of new and old friends who share a common love of things that fly.

Hopefully we would share a new experience, see a famous old aircraft, a new creation or just some camaraderie at the pilots dinner. If everybody helps in a small way, the workload of the few will be greatly eased.

The airshow is a lot of work but provides an opportunity to enjoy a day of fellowship in the company of the best planes and the best pilots from all over western New York, Ohio, PA and Canada.

Don't look at the show as a burden. The revenue always comes back to us in the form of other club activities, in helping to maintain the fields we fly from and as you know, we always donate a portion to Camp Good Days and Special Times.

So, come on out, lend a hand and above all, enjoy the show!

Gathering of Eagles

Friday night at the Nike Site

During our field meeting it was pointed out that every Friday was a **Flying Knight's fly-in** at the Nike Site.

It might not be fully appreciated by all of the members, that certain days and nights have been traditionally set aside for the clubs in the area to get all of their own members together as a group to fly.

Even though, at times a meeting might be held, the main purpose is for members to get to know each other, to help each other and to have fun together.

When each individual goes to the field at random, even over the course of the entire summer, they might never meet the other club members.

They might need help in a particular area, either building or flying and never find out who to ask.

For many years, the RC Crafters, who jointly share the Nike Field with us, have held their meetings on Thursday evenings. Because it is a very large group, the Knights have generally extended them a courtesy and avoided Thursdays at the Nike Site.

The RC Crafters have informally yielded Friday evenings to the Knights.

It is hoped that as many Knights as possible will take advantage of the Friday Night Gathering.

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THE WIND BENEATH YOUR WINGS

BY Jim Devlin

Air in motion.

We use it every time we fly. It doesn't matter whether we are talking about a small model or a 747, lift is the one thing that makes our airplane fly. It is the wind under it's wings.

While the aircraft sits on the ground, no force exists. The plane just lays there. Try as we might, we won't find a bit of evidence for any force.

Lift appears to be mysterious because it comes and goes. For centuries men pondered the flight of birds. They thought there was magic in the feathers and tried to duplicate flight with great feathered wings strapped to their shoulders. If someone were to ask us where this force came from, we too might wonder.

Gravity too, was just as mysterious because it also was not visible. When Newton explained gravity in the 1800's this invisible force was no longer a mystery and men could calculate its effect on the objects around them.

People had been aware of the powerful forces produced by fluids,

especially water for some time. They began to measure these forces.

Bernoulli was the first to measure the subtle changes in pressure caused by a moving liquid. Did these same changes occur in air as well?

First Measurements

The first real measurements of the pressure changes caused by moving air were made by a couple of bicycle guys in Ohio, the Wright brothers. They constructed the very first wind tunnel and made delicate measurements of lift generated by air flowing over a curved surface.

They made the first airfoil shaped propeller with a remarkable efficiency of over 85%. They corrected the lift tables generated by professors by actually doing the measurements. The result was the first true airfoil wing. The rest is history.

So what then is this invisible force that appears out of nowhere, whenever the wind blows?

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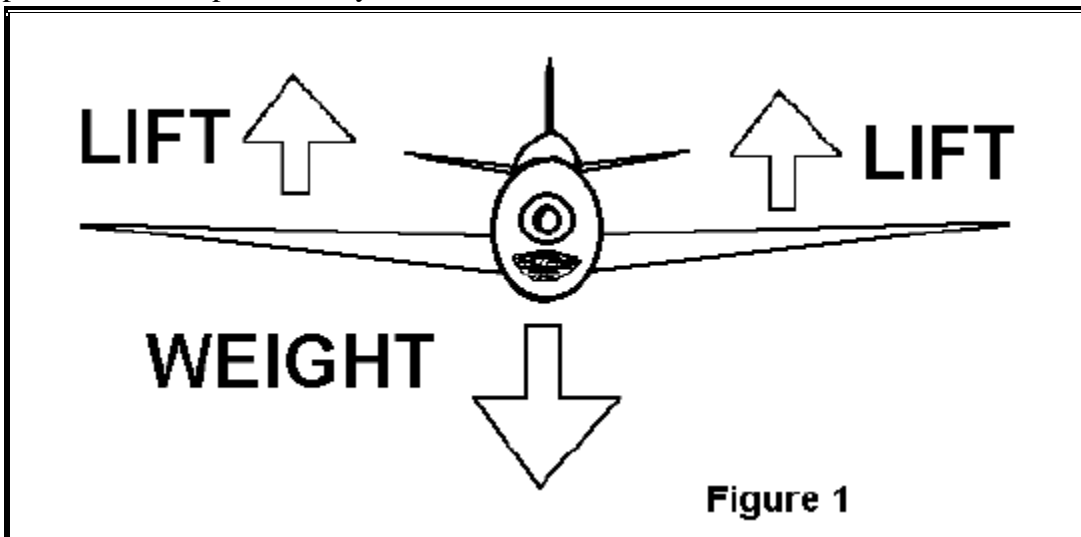


Figure 1

The relationship for lift is kind of simple. **Arrgh! A formula.**

Only three things contribute to the force.

The first is the motion of the air. The faster it moves the greater the force it generates.

Actually, the force increases much faster than the air motion. The force grows as the **square of the wind velocity.**

If the wind doubles, you generate four times the lift. If it triples, you get nine times the lift force.

This should make you feel good as you sit in a 180 ton 747. Velocity is usually measured in feet/second.

The second factor contributing to lift is the **area of the surface** over which the wind is flowing.

The bigger the surface, the bigger the lift. If the surface area doubles, the lift force also doubles.

That's why gliders have lots of wing, compared to their weight.

Area is usually presented in square feet, which makes it a little difficult when we work with a model which is usually in inches.

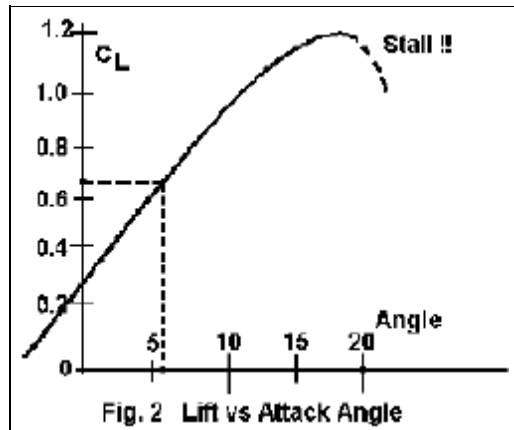
The third thing that makes lift is the **density of the air.** Air, like everything is made of molecules, and of course, the thicker they are packed, the greater the effect they have on other things in their path.

That's why you lose lift as altitude increases. You simply run out of

molecules as you go up. We can use a number for the mass-density of air. At sea level air weighs .076 lb./ cubic ft. The mass-density is .0024.

If we put all of these things together, we'll end up with an expression for the calculation of lift.

With this expression, we can calculate some typical lift forces that our models



generate, as well as the force that will lift a 747 off the ground.

Let's try it out.

First, we'll write out the full expression.

$$\text{Lift} = 1/2 * \text{Density} * \text{Area} * \text{Velocity} * \text{Velocity}$$

$$\text{Mathematically, this is } L = D/2 * A * (V)^2$$

This would give you the maximum lift, which only occurs at about 20 degrees of attack angle. Above that angle we encounter the dreaded "stall". That's when the wing starts to look like a signboard instead of an airfoil.

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Because of these small angles we use a fraction called the Coefficient of Lift. The value ranges from about one down to zero.

Fig. 2 shows how the Angle of Attack is related to the coefficient of lift for a flat bottom wing.

For such a wing the Coefficient of Lift at an angle of zero degrees is about 0.4 (40%). You can read it right off of the curve.

Well, let's do a model.

Say you have a Sig Cadet. It has a nice wingspan of 58 in by 11.5 in. This gives you an area of 667 sq. in. Dividing by 144 gives us 4.6 sq. ft of wing area.

Flying along at about 30 miles/hour, our velocity is 44 ft/sec. Multiplying this by itself we have 1936 sq. ft/second squared.

Well, there we have it. ($0.4 \times .0012 \times 4.6 \times 1936$) gives us 4.27 lbs of lift.

Works for the big guys too.

Do you think this will work for a 747? Let's try it!

This big goober checks in at about 360,000 lbs (180 tons!). However it has a wingspan of 231 feet

with an average chord of 28 ft. That gives a **wing area of 5500 sq. ft.** Now if this monster scoots along at 400 mph with a coefficient of lift of 0.2 we see that it easily generates a lift of over 398,000 lb!

No wonder, the 747 must fly!

Force is really air pressure.

The pressure on the wing at sea level is 14.7 lbs per sq. in. The 747 has 5500 sq ft * 144 or 792,000 sq. in. of wing area. As the wing moves through the air, it creates a small negative pressure on the upper wing surface of perhaps 14.2 lbs.

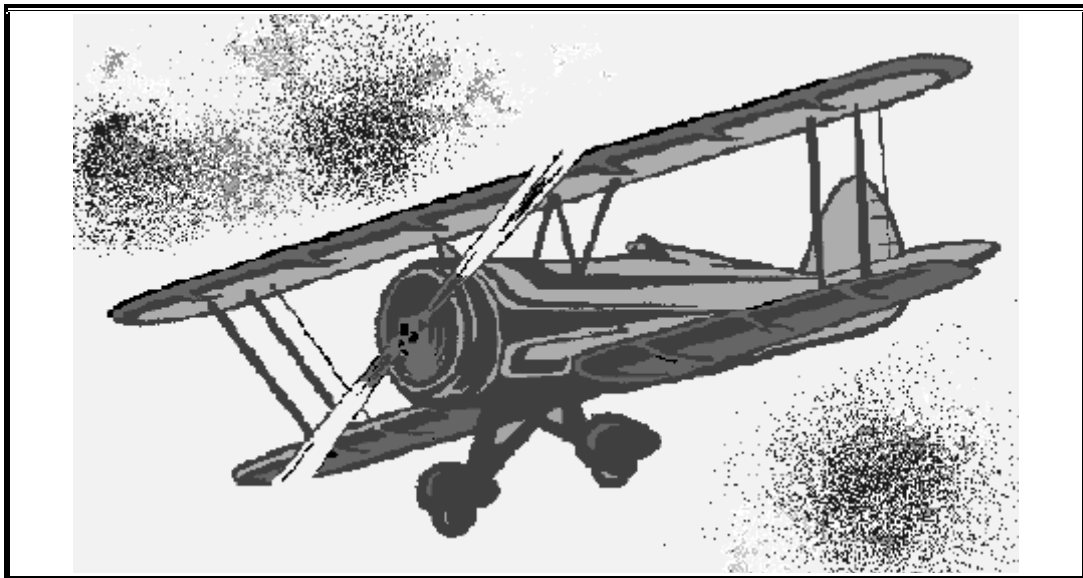
That's a difference of .5 lbs./sq. in. That tiny difference multiplied by the wing area would generate 396,000 lbs, enough to lift the 360,000 lb. monster into the air!

With a calculator you can easily apply this expression to the airplane you are building or flying. Just remember that your units must be in feet, pounds and seconds.

Here is the complete expression again.

Lift = $CL \cdot .0012 \cdot \text{Wing Area} \cdot \text{Velocity (squared)}$ or

$$L = CL \cdot .0012 \cdot W.A. \cdot V^2$$



Here you will find an instructor to help with that first flight of your new plane.

You'll be able to find out who the expert builders are and how to get help with your own building problems. You'll even find experts who have flown every engine from ancient McCoys to the latest afterburner specials.

It was suggested by Gerry Piscitello, that the Club provide a couple of Pizza's and or some Pop at the field on some Friday evening, as an added incentive for the club to participate as a group.

This was unanimously approved.

Pizza and pop showed up on June 18 and were thoroughly enjoyed by all present. Perhaps this treat may be extended to other Fridays.

In addition to our Friday Fly-in at the Nike Site, the club also gathers at the North Collins field off Shirley Road. Every **Sunday and Wednesday evening** you are sure to find a gaggle of knights have descended upon our own club field.

As at the Nike Site, you will find instructors and knowledgeable experts ready to offer help and advice to one and all.

Get those planes ready and head out to the fields. Summer is now!

from Page 2 - Learning to Fly

come to the assistance of new members.

Instructors are at the Club field (off Shirley Rd. in N. Collins) during the day every Sunday and on Wednesday evening.

They can also be found at the Nike Site on Lakeview Rd. on Friday evening.

<p>1999 SCALE RALLY</p>
<p>Hamburg Model Air Park Lakeview Rd. Hamburg, NY Sat. Aug. 7 th. Sun. Aug. 8 th.</p>
<p>10 am to 5 pm Pilots Dinner 5:30 Saturday</p>

from Page 1 - Picnic opens Season

but George is one member who puts in that extra measure to make sure that our events are a success.

While George was "under the knife", so to speak, the ends were pulled together by Harry Kleindinst.

These events would not happen if it weren't for the efforts of guys like this.

About three in the afternoon the eats got under way. One specialty was the roast beef sandwiches that accompanied the menu for the day.

A super "Hat's Off" to all those who provided the wide array of salads and deserts.

The rest of a very pleasant afternoon was filled with food and flying.

The excellent turn of weather was somehow linked to St. George (Gard), but it is the hope of all those who attended, that the string of nice days that we've enjoyed for the picnic will carry over into the next millennium.