



Volume 18 – 02

www.FlyingClub1.org

February 2018



## The Privileged View

Steve Beste, President

**Landing it.** You're on a commercial flight in an Airbus somewhere when the head steward comes on the intercom sounding a little upset. "Ladies and gentlemen, we have a small problem in the cockpit. Both of the pilots have been incapacitated by food poisoning and are not able to land the aircraft. We're currently cruising on autopilot, but is there a pilot on board who could get us down safely?" You look around for some grizzled Right Stuff pilot to stand up, but nobody does. It's all on you! Yes, an Airbus is no Quicksilver, but hey, ailerons are ailerons, rudders are rudders. Your hour has come. Destiny calls! Just don't bugger it up, you tell yourself.



Be honest. We pilots have *all* had that fantasy. You think you could pull it off?



Let me pop your bubble. It turns out that our stick and rudder skills are utterly irrelevant. You won't be needing them at all. Here's a video of what it would *really* be like. Honestly, that computer geek in 23C could probably get it down just as well as you can. [Watch it](#) and weep.



**Flying with the birds.** You've probably seen this next video by now as it went viral in January. 30 million Facebook views. Christian "Birdman" Moullec lies with geese - and takes passengers up in his trike to fly with them.

Watch it [here](#).

The best write-up is from the [Daily Mail](#), which also has still pictures and identifies the locations.



The video is spectacular, but look at how he's modified his trike for this unique mission.

First, no front strut so that the passenger can get close to the birds. He gets that by starting with a DTA Voyageur trike, one of the very few that has no front strut.

Next, he puts his passenger in the front seat. That's backwards from the way all trikes are designed, and it introduces lots of design problems.

- Start with the control bar. The bar and its delta frame are rigidly attached to the wing, of course. usually, the bar falls just in front of the pilot's chest. (See next page.)



*Normal position of a trike control bar, rigidly attached to the wing*

The position of the bar is set by the height of the delta frame and the length of the wires that connect the bar ends to the wing fore and aft. See the left picture below. In the middle picture, Moullec has shortened the height of the delta and adjusted the length of the wires to move the bar aft.



But then what happens when he flies solo? Absent the passenger, the carriage will swing forward as on the right. The bar will press against his chest. He will have no room to pull it in further to control the aircraft. Moullec's clever solution is to put a rotating offset into the bar. Two-up, it's as you see below. Solo, he swivels the bar forward.



*Birdman Moullec's control bar - with swiveling offset*

But he's not done. The rear person in a trike usually sits *tight* behind the front person as you see here. There's no maneuvering room for a control bar in there.



Moullec's solution is twofold. He raises his seat and uses that offset in the control bar so that when he has a passenger the bar is above his passenger's head as you see in his pictures. Clever! Lastly, he moves or duplicates the foot controls (brake and accelerator) to the rear seat. And, of course, he adds a strut for the cameras.

If you want to fly with the birds, go visit him. Here's his [website, translated to English](#). He flies out of [Caluche in south-central France](#).

Fly safely,

Steve



## This Month's Fly-In Destinations

To encourage all of us to get in the air more, the following is a list of fly-ins I found within (about) 100 NM of the Warrenton Airpark which are occurring in the next month. Sources are: The [EAA Calendar of Events](#), [www.flyins.com](#), [www.socialflight.com](#) and the [Virginia Department of Aviation Calendar of Events](#).

Date	Event Description	Location	Distance from 7VG0
Sat, Feb 3 / 9-11:30AM	Lancaster Airport Fly-in Breakfast and Presentation. Breakfast until 10:30AM. Presentation 10:30-11:30AM (pilot/controller forum).	Lancaster Airport (KLNS)	112 NM
Sat, Feb 10 / 8-10:30AM	EAA 518 Fly-in Drive-in Breakfast	Mifflin County Airport (KRVL)	121 NM
Sat, Feb 17 / 11AM-12:30PM	EAA Chapter 1563 Monthly Meeting	Gordonsville Municipal Airport (KGVE)	35 NM
Sat, Feb 24 / 8:30-10:30AM	EAA Chapter 339 and Commemorative Air Force Old Dominion Squadron Fly-in pancake breakfast	Franklin Municipal Airport (KFKN)	125 NM
Sat, Mar 3 / 8AM-1:30PM	Fly-in Breakfast and Poker Run - collect tickets from airports ahead of time! See <a href="#">flyer</a> .	Bloomsburg Municipal Airport (N13)	154 NM

## Debunking the Misconception in Flying

*By Jim Heidish*

They say I question authority too much, am too inquisitive at times. I guess so, especially when the subject is one I love.

Many years ago (in the mid-1950's) when I was in an 8th grade general science class, the teacher brought up the principles of how an airplane's wing produces lift. The classic, flow over the curved top going faster than the flow along the flat bottom and creating less pressure on top and more on the bottom. *The Bernoulli Principle*. Having built and flown many model airplanes by this time, I put my hand up and said, "May be so, but I fly models with flat wings and ones curved the same top and bottom!" The teacher countered my interruption with "They are just toys and models, not real aircraft and don't fly the same way." I knew this was BS and it started a lifelong in-depth study of aerodynamics and aeronautical engineering that continues to this day.

That in-depth study and my 50 years of flying still has me questioning aviation authority, be it the FAA, flight instruction manuals and yes, 8th grade school books. In this hi-tech age some still state aerodynamics concepts and airmanship principles that are full of half truths, misconceptions and some that are just completely wrong and unsafe.

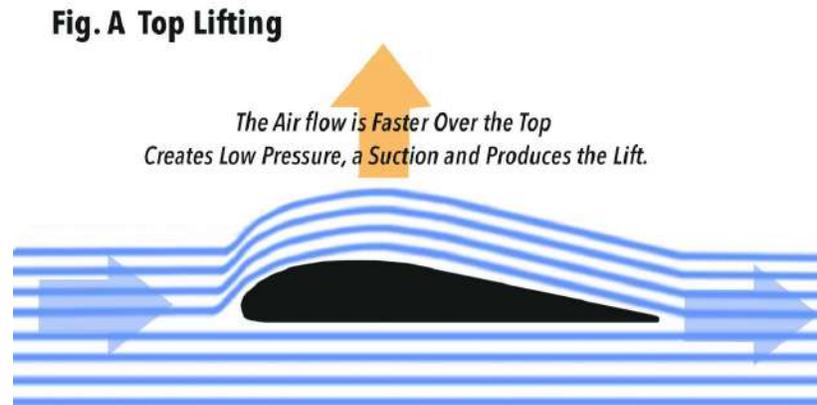
Aerodynamics and aeronautical engineering has a longer list of complex scientific principles, laws and mathematic formulas than any other form of transportation. All work or we would not have had all the advances in flight over the past century. But this highly technical process can be lost in translation to the novice if not presented and illustrated by someone who understands flying. Sadly, this has happened in many instances.

I would like to pass along to the members of our flying club what I have learned, the knowledge acquired in my quest to debunk the misconceptions in flying. I plan to do this through our monthly newsletter. Through writing and illustrating I will present some of the stand-out misconceptions, state what is wrong, and then I will present what I see as the correct concept/principles and how they apply to our everyday flying.

*NOTE, these are my conclusions based on years of study, knowledge acquired through experimenting and flying experience. If one does not agree or understand, it should always be questioned and/or made clear! Never take it for granted!*

## *How a Wing Creates Lift*

### Misconception A:



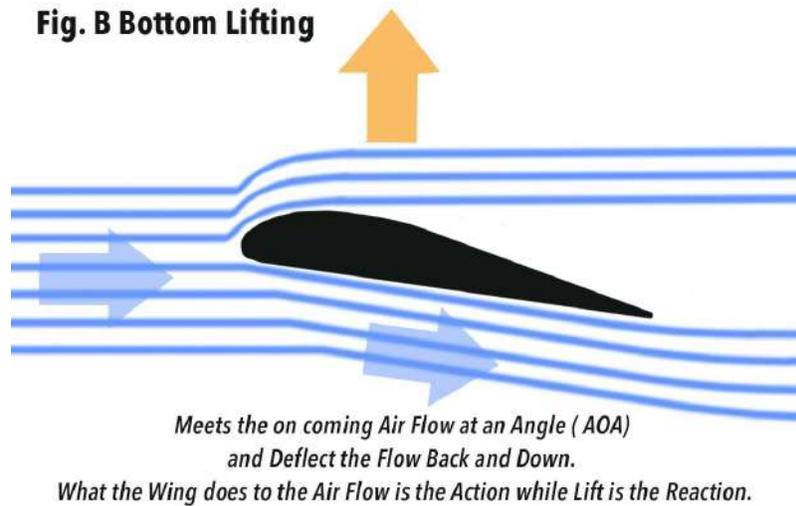
(See Figure A) This very popular concept says that airplanes fly as a result of *Bernoulli's Principle*, which states that: *if air speeds up within a flow, the pressure is lowered*. Thus a classic wing airfoil generates lift because the air flow (relative wind) goes faster over the top, creating a region of low pressure, suction and lift. The greater speed of the air is directly related to its greater distance of travel. The usual claim is that when the air separates at the leading edge, the part that goes over the top (greater distance / faster) must converge at the trailing edge with the part that goes under the bottom (shorter distance / slower) at the same time. This is the so-called *principle of equal transit times*.

**Half-true!** The airflow is faster over the top, a lot faster than the bottom flow, but the time is shorter than the transit time of the bottom flow (not equal). It definitely creates low pressure, a suction and produces some of the lift.

### What is wrong?

1. It only address the lift from the top of the wing and assumes that only more speed will give more lift. As we know that is not true.
2. It does not address how a wing can fly upside down and how symmetrical airfoils (same shape top and bottom) and very flat high speed airfoils create lift, as we know they can.
3. It does not address what is happening to the airflow on the bottom of the wing (airfoil) and how it is creating lift or the total effect the wing has on lift.

## Misconception B:



(See Figure B) This concept says that airplanes fly as a result of *Newton's third law* that states: *For every action there is an equal and opposite reaction*. In order to generate lift the wing (airfoil) must meet the oncoming air flow (relative wind) at an angle and deflect the flow back and down. What the wing does to the air is the *action* while lift is the *reaction*. This angle is called the *angle of attack (AOA)* and varying it can affect the amount of lift and also the speed of a wing. High AOA produces a larger down flow of air at a slower wing speed and low AOA produces a smaller down flow of air at a faster wing speed.

**Half true!** The wing meeting the oncoming air flow (relative wind) at an angle (AOA), deflecting the flow down (the equal and opposite reaction) to create lift is a very easy concept to grasp. Also we know as pilots that we vary the AOA with our elevators to get changes in lift and also speed.

### What is wrong?

1. It only addresses the lift from the bottom of the wing and assumes that the top flow is not important.
2. It also assumes that the shape of the wing's airfoil has no effect in creating lift or the total effect the wing has on lift.

### So, how does a wing create lift?

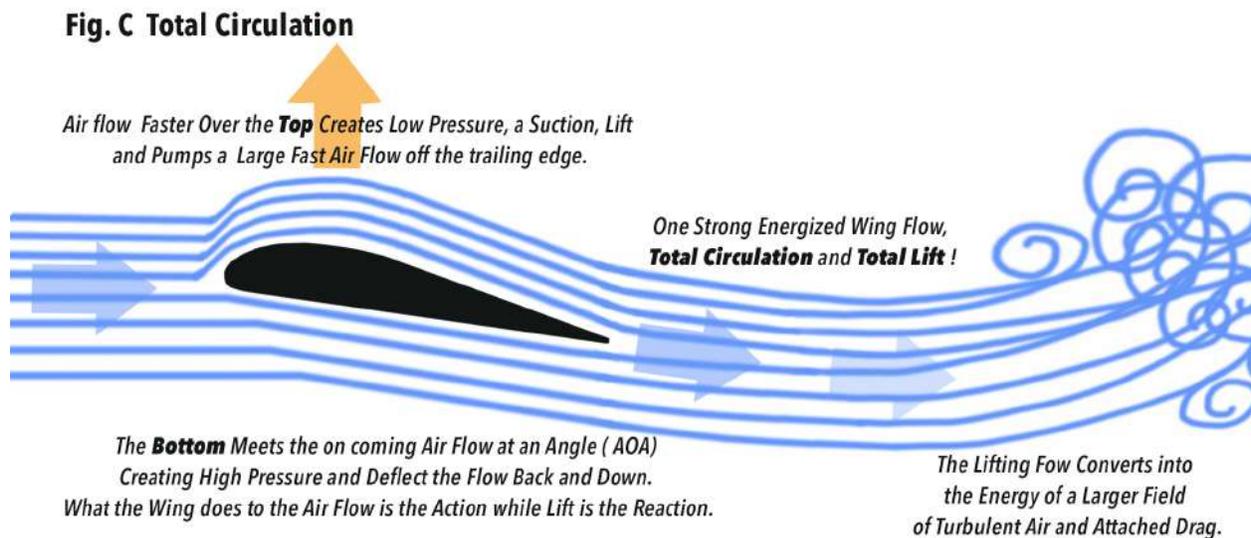
First, we need to clarify what lift is. It is not just the realm of airplane wings. Anything in a strong air flow that can move perpendicular to that flow is said to have lift. Almost anything can lift if given the right circumstances. Bricks have been known to lift straight up in hurricane winds. Even a very streamlined bullet can lift if it wobbles in its ballistic course. The wing is just a very efficient producer. The birds have known this for a long time and inspired our artificial ones. We

owe mother nature's streamlined birds for our design of the basic wing and its cross sectional shape that we call the airfoil. These wonderful low drag shapes within the energy of a constant flow of air made it possible for man to fly.

We need ENERGY to fly! Be it flapping wings, thrust from a propeller or the exchanging of the potential energy of height to the kinetic of glide. It is the *Conservation of Energy*: how the energy of fossil fuel (gasoline) can be converted into the energy of thrust, and the air flow created by thrust is converted into the energy of lift, and then the energy of lift is converted into the energy of a larger field of turbulent air and attached drag. It is the main scientific principle why birds and man are able to fly. Understanding this and how it applies to aerodynamics has led to designs that are very energy efficient (convert thrust to lift with the least loss to drag) and produce airfoils and wings of all shapes with high lift over low drag ratios.

Because we are always using energy to fly and fight the force of gravity, we are also developing an Energy Bank as we climb up higher in altitude. This is also the *Conservation of Energy* at work, the building up of potential energy that can be used as kinetic in a glide.

Keeping in mind the *Conservation of Energy*, taking what's right (half truths) from misconception A and B and combining them with the concept of TOTAL wing flow circulation, we see that the total wing is involved in creating lift.



(See Figure C) Illustrated is a classic wing airfoil with a medium *angle of attack* (AOA) to the flow of air (relative wind). Its leading edge diverts the flow up towards the top and the bottom deflects the flow back and down to the trailing edge. This simple high pressure bottom flow is very much the *equal and opposite reaction* as stated before. The flow that is diverted over the top of the airfoil is much more complicated because it has to change direction and also keep attached. It accomplishes this by the flow being squeezed on the curved first 1/3 of the top and in response to keeping up with the volume, it speeds up producing a lower pressure and suction. This high

speed, low pressure flow is again the *Bernoulli Principle* as stated before. What is different is how it works with the bottom! This high speed and low pressure not only produces lift, but more importantly holds the airflow to the top of the wing as the wing changes the *angle of attack* (AOA) from low to very high as we fly. As the top flow's pressure recovers it pumps a large fast (faster than the bottom flow) air flow to the trailing edge where both top and bottom flow combine as one strong energized wing flow (Total Circulation) resulting in a very efficient lifting device. This lifting flow converts into the energy of a larger downwash field of turbulent air and attached drag. As with all forms of energy, they don't always convert efficiently. In creating lift from a relative wind we get attached drag. The amount of drag depends on airfoil and wing shape, but more so the AOA. The turbulent air and downwash can continue for some time, as any pilot knows if they fly into the so-called *wake turbulence* of a passing aircraft (see Figure D).



**So how do flat and symmetrical airfoils/wings create lift? Countering the 8th grade science class.**

Flat wings can lift but only at a small angle to the oncoming relative wind (AOA) and quickly develop top separation, high drag and very abrupt stalls. High speed supersonic wings look very thin, almost flat, and produce most of their lift from airspeed. When they slow down they deploy leading edge wing slats and rear flaps that give a very curved top on the wing and use high angles (AOA) to produce slow speed lift needed for takeoff and landing.

Symmetrical airfoils/wings do not produce much lift at 0 AOA, but with a little AOA they use the same curved region (same as top) of low pressure, suction that speeds up the front part of the bottom flow and adds to the rest of the deflected flow becoming a very efficient lifter with lower drag than a flat bottom wing/airfoil. Most higher speed aircraft, say over 125 MPH, have some curve to their wing/airfoil bottom because of this. They produce most of their cruise lift from air speed at a low AOA and low induced drag.

**For your information**, the formula for lift is  $L = (C_L)(\frac{\rho}{2})(S_W)(V)^2$  in lb. It is more complicated than it looks because each part has its own equation, but in general the parts are:  $C_L$  is the airfoil lift/drag coefficient,  $\rho$  is the air density,  $S_W$  is the wing area, and  $V$  is the flow speed in ft/s. The airfoil lift/drag coefficient can vary with AOA. Air density can change with altitude and temperature and airflow speed can change with relative wind/thrust. Even though the wing area stays the same, the AOA changes its total effect. At low AOA the wing doesn't use its full potential but at high AOA it is the real lift maker.

## Meeting Minutes

*January 2018*

### *Flying Club One Meeting*

Thursday, January 4, 2018  
Centreville Regional Library  
Centreville, VA

#### Call to Order

*President Steve Beste* called the meeting to order at 7:30 P.M.

10 members present.

We had a short **Board of Directors** meeting to nominate and approve three new Directors. They are **Lucy Ooi, Peter Bastien** and **Robert Doak**.

#### CONNECTIONS

#### Visitors & New Members

None

#### Old Members

With the cold winter weather keeping most of the members on the ground, **Peter Bastien** was out flying the King Air just like any other day, lucky guy! **Dick Martin** is flying a little drone and he impressed everyone by flying it inside our meeting room.

#### REGULAR REPORTS

*Secretary: Jim Heidish* reported that the December Minutes were published in the January Club Newsletter and they were approved as published.

*Treasurer: Jim Birnbaum* reported that December income was \$140.00, expenses were \$206.17 and the check book balance is \$2713.90.

*President: Steve Beste* - nothing to report

*Membership Director: Jim Birnbaum* reported that he is collecting 2018 dues and paid up members are always listed with (2018) after their name in the monthly email roster.

*Warrenton Airpark Owner: Tom Richards* - nothing to report

*Events Coordinator: Robert Doak* - nothing to report

#### Old Business

None

#### New Business

None

#### MONTHLY PROGRAM

**Tom Richards** presented a projected visual program on aerodynamics and airmanship. He explained some of the basics and the scientific laws that govern them. Tom also pointed out some of the misconceptions in flying that most pilots take for granted. The presentation started a discussion and there were many questions on it and other misconceptions in flying that we will continue at our next meeting.

#### Adjourn

*President, Steve Beste* adjourned the meeting at 8:45 P.M.

Submitted by **Jim Heidish**, *Secretary*

## Service Providers

Recap our standing list of service providers:

- **PPG instructor and dealer:** Michael O’Daniel, 540-270-8855
- **Aircraft instructor - CFI:** Pete Bastien, 703-568-5778
- **Trike instructor:** Pat Tyler, 202-746-4687
- **Aircraft instructor - light sport and seaplane:** Chuck Tippett, 540-905-5091
- **Ultralight (Part 103) instruction:** Tom Richards’ Grass Roots Flyers, 703-568-3607
- **Machinist:** Luther Taylor, 540-222-3927
- **Welder:** Luther Taylor, 540-222-3927
- **A&P mechanic/IA (not at Airpark):** JD Ingram, 513-388-6312
- **Light Sport Condition Inspections, Rotax Certified:** Tim Loehrke, 703-618-4005

## Activities

### *Flying Club 1 Activities Schedule*

Designated Club meetings will be held the first Thursday of each month in the Centreville Regional Library, 14200 St. Germain Drive, Centreville, VA, at 7:30 PM. Others will be held at 11:00 AM at the Warrenton Airpark as shown in the 2018 schedule. Changes in time or location will be posted in this newsletter and on the Club website.

Date	Activity	Location
Thu, February 1st, 7:30 pm	Conversation, club business meeting and program (You've Engine maintenance, especially 2-stroke)	Centreville Regional Library
Thu, March 1st, 7:30 pm	Conversation, club business meeting and program (You've landed out. Now what?)	Centreville Regional Library
Sat, April 14th, 11 am	Club meeting, fly-in and cookout at Warrenton Airpark	Airpark
Sat, May 12th	Club meeting, fly-in and cookout at Warrenton Airpark	Airpark
Sat, June 9th, 8:00 am	Poker Run	Airpark
Sat, June 9th, 11:00 am	Club meeting, fly-in and cookout at Warrenton Airpark	Airpark
Sat, July 14th, 11 am	Club meeting, fly-in and cookout at Warrenton Airpark	Airpark
Sat, August 11th, 11 am	Memorial table, monthly meeting, fly-in and cookout at Warrenton Airpark	Airpark
Sat, September 8th, 11 am	Club meeting, fly-in and cookout at Warrenton Airpark	Airpark
Sat, October 13th	Club meeting, fly-in and cookout at Warrenton Airpark	Airpark
Sat, October 24th	Club 1 Color Run Fly-out	Airpark
Thu, November 1st, 7:30 pm	Conversation, club business meeting and program	Centreville Regional Library
Sat, December 8th, 5 pm - 8 pm	Monthly meeting and Holiday Party	Airpark Club House

## Classifieds

Ads will be run twice and then dropped unless resubmitted, or renewed by telephone or e-mail. Please advise the editor: **Lucy Ooi** ([Ooi.Lucy@gmail.com](mailto:Ooi.Lucy@gmail.com)) when the ad is no longer needed.

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### **For Sale: ½ ownership of Fisher Celebrity Biplane**

Powered by new Rotec R2800 radial engine.

110 horsepower, 7 cylinders. Made in Australia.

All wood construction except for landing gear which is Grove one piece aluminum.

Hangared at Warrenton Airpark.

Aircraft is about 80% completed.

2 place open cockpit plane cruises about 80 MPH.

Qualifies as light sport.

I am offering my half of this fine project, but if buyer desires, entire aircraft may be purchased.

Call for further info or to make appointment to see this beautiful taildragger.

**Gil Coshland - (703) 618-3422**

**Jim T. Hill - (703) 659-8336**

**Weight-Shift Enthusiasts - Your prayers have been answered!** A very nice up-scale trike at an affordable price...

Specifications: NorthWing Navaho (strut braced - no king-post), 2-seat Tandem

Engine: Rotax 582 blue head with C- Gear-Box and just under 300 hours total time (never overhauled)

Well-maintained - dacron fabric and everything else looks brand new.

Many extras including Radio, GPS, Landing Lights, wheel pants, hydraulic disc brake system, wide tires, 3-blade IvoProp, 2017 Virginia License, 1,050-lb BRS parachute for safety and extra parts.

Photo below was taken at Shannon Airport. This Trike is owned by Kiho Bae, and has recently moved to Warrenton Airpark. Kiho Has asked me to advertise this at an asking price of \$18,500. Incidentally, Kiho is an experienced pilot who flew C-46 Commanders in the Korean Air Force, and now flies a Robinson R-44 Helicopter and single-engine fixed-wing as well as weight-shift aircraft. He would be happy to take you for a demonstration ride. Kiho is willing to fly it to your location.



**Special Price \$18,500**

**Call Tom Richards (703) 568-3607 or Kiho at (703) 314-6262**

**Airfield and house for sale.** Dr. Bob Karmy has long been a friend of the Club, letting us fly into Karmy's (67VA) for years. He's now retired and is selling the place. It includes a large house, with a hangar and an 1,800' grass strip just south of Woodstock in the valley. This would make a great training field. And do notice the hot tub in its own little house. The listing and pictures are [here](#). Asking \$899,000.

Contact the realtor, Shirley French. [Shirley@funkhousergroup.com](mailto:Shirley@funkhousergroup.com) 540-325-4444.



## Membership Dues Policy

The period of membership follows the calendar year - January through December. The renewal period starts on 1 October with regular dues at \$20.00 and family at \$25.00. Members who have not paid their dues by the end of February will be dropped effective 1 March and will not receive the Newsletter or Membership Roster. New members joining after 1 October will be charged \$20.00 or the family rate, if applicable and will be credited with full membership for the following calendar year. Please mail payments to Flying Club 1, 8570 King Carter Street, Manassas, VA 20110. Payment can also be made at the regular monthly meeting. Please include the Membership Application form with your payment. This will be used to ensure that our records are current. A copy of the membership application is attached and also printed at the end of the Newsletter.

Jim Birmbaum  
Flying Club 1  
Membership Director, Treasurer

## MEMBERSHIP APPLICATION



Type of membership:  New,  Renewal,  Regular,  Family membership

Name(s): \_\_\_\_\_

Name To Go On Your Name Tag: \_\_\_\_\_

Street or PO Box: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone, Home: \_\_\_\_\_ Cell: \_\_\_\_\_ Work: \_\_\_\_\_

Spouse's Name: \_\_\_\_\_

Emergency Contact: Name: \_\_\_\_\_ Phone: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

Aircraft Liability Insurance through: \_\_\_\_\_

Aircraft make and model: \_\_\_\_\_ N-Number (if any): \_\_\_\_\_

Pilot rating(s): \_\_\_\_\_

Club Activities or Services for Which You Volunteer: \_\_\_\_\_

Information from this application will be in the club's membership roster which goes only to members.

### **Instructions:**

1. FILL OUT THE ABOVE FORM.
2. ENCLOSE A CHECK FOR \$20 (\$25 FOR A FAMILY) MADE OUT TO **“FLYING CLUB 1”**.
3. SEND THE FORM AND CHECK TO:  
Jim Birnbaum, Treasurer  
8570 King Carter Street  
Manassas, VA 20110-4888

To join the national USUA, go to <http://www.usua.org>

To join the national USPPA, go to <http://www.usppa.org>

## Flying Club 1 General Information

The Flying Club 1 is a nonprofit, recreational club dedicated to the sport of ultralight and light sport aircraft flying.

### 2018 CLUB OFFICERS AND DIRECTORS

President: Steve Beste 703-321-9110

Vice President: Dick Martin 703-242-2367

Secretary: Jim Heidish 703-524-5265

Treasurer: Jim Birnbaum 703-361-7478

Events Coordinator: Robert Doak 703-897-4989

Director At Large: Pete Bastien 703-568-5778

Director At Large: Robert Doak 703-897-4989

Director At Large: Lucy Ooi 585-410-5573

*ber support in varying amounts. Please indicate on your membership application the function(s) (can be more than one) you will support as a Club member. All active Club members are expected to participate. However, members who live some distance away and cannot attend meetings regularly may prefer to support functions associated with Club weekend activities.*

**ANNUAL DUES** (Jan 1-Dec 31) \$20.00. Family membership (typically husband and wife): \$25.00. A spouse who wishes to participate will please complete a membership application form.

### 2018 CLUB VOLUNTEER STAFF

Safety & Training: Vacant

Membership: Jim Birnbaum 703-361-7478

Club Artist: Jim Heidish 703-524-5265

Newsletter Editor: Lucy Ooi (“Wee”)

[Ooi.Lucy@gmail.com](mailto:Ooi.Lucy@gmail.com)

Web Master: Steve Beste,

[president@flyingclub1.org](mailto:president@flyingclub1.org)

*A club is only as good as the members who volunteer to support its activities. The following listed activities with the club require mem-*

**CLUB WEB SITE:** <http://flyingclub1.org>

**MEETINGS** are monthly, year-round. See the web site for dates and places.

**THE NEWSLETTER:** The newsletter is published by email on the first of every month.

**SUBMITTING ITEMS FOR THE NEWSLETTER** Members and non-members are encouraged to submit items for this newsletter. Send submissions to Lucy Ooi at [Ooi.Lucy@gmail.com](mailto:Ooi.Lucy@gmail.com) at least one week prior to the end of the month.

**If you are interested in joining the U.S. Ultralight National Organization go to their website for membership information at: [www.usua.org](http://www.usua.org)**

**Likewise, if you are interested in joining the U.S. Powered Paragliding Association, the National PPG Organization, go to their website for membership information at: [www.usppa.org](http://www.usppa.org)**