



CHAPTER 613

May 2004

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“Hey buddy, stay on your own side of the grill”

Chapter 613 April Pancake Breakfast
Moe Boisvert and Donald Taylor cook pancakes with optional blueberries
and nuts

Upcoming Events

May 22 (Sat) 9:00-1:00

Pancake Breakfast – Middlebury State Airport (6B0) – Middlebury, VT

May 22 (Sat) May 23 (Sun) rain date

Young Eagles Rally – Dean Memorial Airport (5B9) Haverhill, NH

May 30 (Sun) Fiddle Fest

Knox County Airport (RKD), Owls Head, Rockland, Maine

June 5 (Sat) – 6th Annual Flyin

Falmouth Airpark (5B6), Falmouth, MA

June 8 (Tue) – 9:00 to 4:00

Young Eagles Rally – Edward Knapp Airport (MPV) Montpelier, VT

June 12 (Sat) – 9:00 to 5:00

International Young Eagles Day
Franklin County Airport (FSO)
Highgate, VT

June 19 (Sat) – 7:30 to 11:00

Fly-In Pancake Breakfast – Cooperstown /
Westville Airport (K23) Cooperstown, NY

June 19-20 Taildragger Rendezvous

Rutland State Airport (RUT) – Rutland, VT

June 25,26,27 (Fri,Sat,Sun) – 9:00 to 5:00

Ultra light Fly In, Fly Young Eagles,
Pancake Breakfast (Sat) – Franklin County
Airport (FSO) Highgate, VT

July 8 (Thr) – 9:00 to done

Young Eagles Rally – Hartness State Airport (VSF) Springfield Vt.

Views and News By Bill Morelli

Scheduled Events: To locate additional scheduled events other than those listed above, check out the Atlantic Flyer on-line at aflyer.com or in a hardcopy available at most airports.

Hobie Tomlinson continues his series in the "Flight Advisor Corner" starting on page 7. This month it's **Wind Shear**

April Minutes

By Marge Butterfield

It was the best turnout of the season for the April 25th pancake breakfast and meeting at the Franklin County Airport. The theme was for Easter and Spring and there were even jelly beans to be had. **Donald Taylor** and **Moe Boisvert** did a great job in keeping up with the demand for pancakes and sausages. The weather also cooperated, so quite a few members were able to fly in for the morning's event. Following the breakfast, a meeting was called to order by President, **Terry Griffin**, at 10:25 a.m. The minutes of the meeting are as follows:

- Thanks were extended to **Donald Taylor** and **Joe Gardner** for setting up for the breakfast.
- Thanks and rounds of applause were also extended to **Moe Boisvert** and **Donald Taylor** for their fine cooking.
- The Secretary's Report was accepted as published in last month's newsletter.
- Treasurer, **Steve Couzelis** presented the Treasurer's Report for the period March 21, 2004 through April 25, 2004. There is a current balance of \$7,861.35 in the general account and a balance of \$987.05 in the *Edmando Roberti Scholarship Fund*. The present value of the Mary J. McGrath Scholarship Fund is \$31,668.71. A motion was passed to accept the Treasurer's Report.

- Basin Harbor will be opening around Mother's Day weekend. Time for some fly-outs!
- There will be a pancake breakfast at the Middlebury State Airport on Saturday, May 22nd fro 9:00 – 1:00.
- Another idea for a fly-out is the Fly Market at Hampton, NH. There is 2300 grass strip for landing and also a restaurant on the field.
- **Frank Gibney**, Scholarship Chairman, advised that there has been a lot of activity for the scholarships. There are 3 applicants for the *Edmando Roberti Scholarship* and there is a strong candidate for the EAA Air Academy. There are no applicants for the Mary J. McGrath Scholarship; however, one of our members may be applying. Frank thanked **Donald Taylor** for referring a couple of the candidates for the scholarships. Frank also advised that the scholarship applications are on line.
- If any members have any articles or pictures that they find interesting, please send them to **Dick Bayer**, webmaster, so he can get them on our Chapter Web Site. See the back page of the newsletter for Dick's e-mail address.
- Young Eagles Coordinator, **Donald Taylor**, announced that he has sent in the paperwork for the upcoming Young Eagle Rallies. He needs to hear from members as to who can fly the Young Eagles and who can help with the paperwork. Please call Donald at 868-3809.
- **George Coy** advised that the State is going to give our Chapter a lease on the property for our Chapter hangar. Norm Sears is going to donate lumber. If anyone can contact companies for donations in materials or money, they can write it off, since our chapter has a 501© status.
- **Donald Taylor** has volunteered to help George with respect to the new hangar. More volunteers will be needed. Donald also suggested that we have a place for a clubhouse in the hangar so that we can hold the pancake breakfasts and meeting there.
- **Terry Griffin** announced that the Fly-in and Young Eagles Rally at Saranac Lake will be held on August 21st and 22nd.
- **Tyler Hart** advised that the Cooperstown Westville Airport puts on a fantastic pancake breakfast. It has a grass strip for landing. Chapter 1070 holds pancake breakfasts throughout the summer there from 7:30 – 11:00 on May 15, June 19, July 17 and August 21.
- It was announced that the airport at Orange, MA also holds pancake breakfasts. Check the Atlantic Flyer for more details

Young Eagle Rallies

The upcoming Young Eagle Rallies are fast approaching! We need volunteers (both pilots and groundcrew) for the Tuesday, June 8th rally at Montpelier, the Saturday, June 12th rally at the Franklin County Airport and the weekend rally on June 25, 26 and 27th at the Franklin County Airport. **Please contact either Donald Taylor at 868-3809 or Marge Butterfield at 878-6337. THANKS.** As always, your help is much appreciated!

50/50 Raffle

The meeting was over and everyone was waiting for the big moment...the 50/50 raffle. The winnings were \$25.00. The winning ticket was pulled out of the canister and the lucky winner was none other than.....yes, you guessed it.....
Marge Butterfield. She shamelessly collected her winnings amidst the lamenting groans. Do I dare say ... Congratulations Marge???



YOUNG EAGLES

by
Donald Taylor

To date we have only one pilot reporting Young Eagle flights.

Donald Taylor 2

If you have flown Young Eagles this year, please let me know so we can put them in the news letter.

Young Eagle Rallies 2004 are taking shape

We need pilots and ground crews. Please let Donald Taylor or Marge Butterfield know if you can help!!

Below is a list of the Young Eagle Rallies scheduled.

◆ Saturday, May 22 – Sunday May 23 (rain date) - Dean Memorial Airport (5B9) Haverhill, NH – Need pilots but if you want a ride over, check with the pilots

◆ Tuesday, June 8 - Edward Knapp Airport (MPV), Montpelier, VT 9:00 – 4:00

◆ Saturday June 12 – International Young Eagles Day – Franklin County Airport (FSO) Highgate, VT – 9:00 – 5:00

◆ Friday – Sat – Sun – June 25,26,27 – Ultralight Fly In, Fly Young Eagles and pancake breakfast on Sat June 26. Franklin

County Airport (FSO) Highgate, Vt. 9:00 – 5:00

◆ Thursday, July 8 - Hartness State Airport (VSF) Springfield, VT 9:00 to done

◆ Saturday – Sunday, August 21-22 Adirondack Regional Airport (SLK) Saranac Lake, NY 9:00 – 4:00

◆ Saturday, September 25, Shelburne Airport (25VT), Shelburne VT

Safety Tip

Taxi Procedures

If you become uncertain about your location on the airport movement area, make sure you are clear of any runway and stop the aircraft.

Advise ATC and if necessary, request progressive taxi instructions.

Use extra caution when directed to taxi on a runway, especially at night and during reduced visibility conditions. Use all resources available to keep your aircraft on its assigned taxi route.

Make sure you comply with hold short or crossing instructions when approaching an entrance to an active runway.

Scan the full length of the runway and the approaches before entering or crossing any runway, even if you have received a clearance.

Did You Know

Who Is Responsible For My Aircraft Maintenance?

14 CFR part 91, section 91, 403 makes the owner / operator primarily responsible for maintaining the aircraft in an airworthy condition including compliance with airworthiness directives.

The owner / operator is also responsible for ensuring that maintenance personnel make appropriate entries in the aircraft maintenance records for return to service.

It is the responsibility of the owner and operator to have maintenance performed that may be required between scheduled inspections.

Flight Advisor Corner



WIND SHEAR

As a follow up to last month's article on stalls, I thought I would do an article on wind shear. Most pilots who fly "light" aircraft don't give much attention to wind shear, assuming (in error) that it is only a problem for large aircraft operating in the vicinity of severe thunderstorms. Nothing could be further from the truth! To compound this problem, most of us have been subjected to much well intended (but erroneous) teaching over the years about the affect of wind changes on an aircraft in flight.

The pilots who flew the heavy, low powered aircraft of the twenties learned to have a great respect for the effects of wind. It turns out the old axiom, "don't make downwind turns close to the ground", was more right than we thought. Just ask any crop duster or seaplane pilot who has made low energy, downwind turns close to the ground how the airplane's performance was affected. (Another very good reason not to try a low altitude runway turn-back after engine failure!) The reason for this is the energy loss wind shear effect which occurs throughout the duration of the turn. It was in the thirties, with the advent of higher powered aircraft, that we decided an aircraft was a free floating object in the air and that wind changes

had no affect on it. Then came the sixties with jet aircraft and micro bursts and we suddenly discovered what pilots knew in the twenties, that wind changes can have a large affect on an aircraft in flight. Even balloonists can be affected. Several years ago at a balloon meet in Albuquerque, N.M., a balloon crashed when they penetrated a strong shear layer during ascent and the shear collapsed the envelope!

To start with, we need to discuss what the term "Wind Shear" actually means and the affect it has on an aircraft in flight. We have discussed the four "Forces of Flight" in previous articles, but a brief review is in order here. The longitudinal forces are Thrust (the forward force produced by the power plant) vs. Drag (the retarding force produced by the aircraft's motion through the atmosphere). Drag is composed of two parts_ Induced drag which is created by the wing producing lift (the aft portion of a rearward tilted lift vector) and Parasite drag which is the result of air friction around the airframe structure. The two vertical forces are, of course, Lift (produced by the wing) vs. Gravity (produced by the earth). These opposing forces must balance each other for an aircraft to be in "steady state" flight.

Increasing engine power (Thrust) will cause an aircraft to accelerate (thus increasing Drag) until the forces are again balanced. Drag increases as the square of the speed increase, so it doesn't take long for drag to balance the thrust increase of most light aircraft!

Decreasing power reverses the process. Increasing lift above that required to offset Gravity, via a speed or an Angle of Attack (ADA) increase, will cause the aircraft to climb until lift is reduced to equal Gravity. This can be done

by either lowering the AOA or making a speed reduction. Because changing lift also changes drag, and because flying an inclined flight path (climb or descent) cause's part of the Gravity vector to act as thrust or drag, the pitch vs. power debate will last as long as aviation does.

Some time during one of these articles I will wade into that quagmire, but for now we want to discuss wind shear.

One of the cardinal laws of physics is that all objects which have mass (weight for us non scientists) have a property called inertia. That is, when objects that have weight are put in motion they tend to stay in motion at a constant velocity and direction unless another outside force (like friction) acts upon them. Objects in the earth's gravitation field have their inertia measured in some unit with reference to the earth (i.e. knots, ground speed). I said all that to say this: the most important concept to understand when discussing wind shear is that an aircraft's inertia is solely in reference to its groundspeed.

The earth's atmosphere is an incredibly complex dynamic that has been vastly oversimplified in many aviation texts. Even scientists using today's super computers still struggle to predict all its effects.

Critical to understanding wind shear is the concept that wind (the movement of air) is not limited to the horizontal direction, but can be thought of as able to move in any direction from the center of a sphere. It can thus, and does, have vertical as well as horizontal directions, hence updrafts and downdrafts (lift and sink) and mountain waves. Because air also has weight (hence inertia) atmospheric disturbances may exist some distance away from the generating source! Look at a rushing mountain stream as it flows over and around obstacles in its path. These same turbulent flows exist as wind flows over and around obstacles in its path, just not visibly!

The plot now thickens as we come flying merrily along in air moving with one direction and velocity then rapidly transverse into air moving at a different direction and velocity. The aircraft's inertia initially keeps its ground speed

constant and its airspeed changes; hence the term "Wind Shear"! (If ground speed = true airspeed +/- wind and inertia tends to keep the ground speed constant, then a wind change must produce an airspeed change.) Why don't we see that all the time you ask? Good

question - remember the 4 forces of flight?

When the airspeed changes, Drag changes - Unbalancing the Thrust /Drag forces. The aircraft now accelerates/decelerates back to the original speed, which rebalances the Thrust /Drag forces. It is during this process that the ground speed changes. Most of the time this happens slowly over a long enough time period that we are not even aware of it. Modern "high tech" panels with their multitude of information displays will let you observe the altered aircraft performance parameters when a wind change event is occurring.

Problems start to occur when the wind change event happens so quickly that the altered Thrust/Drag forces do not have time to restore equilibrium and we are left with an unwanted airspeed change! This is especially critical when we are operating low to the ground in a relatively low energy state, (read takeoff and landing). Different aircraft have different tolerances for wind shear, the worst being a low performance aircraft with low approach/departure speeds. A low performance aircraft is one with a high power loading (aircraft weight divided by engine horsepower). This is especially critical when combined with a high wing loading (aircraft weight divided by wing area in square feet). An aircraft that comes readily to mind is the Grumman Yankee. It had the same power loading as a CE152 combined with the same wing loading as a CE182! It has caused many pilots to come to grief. (I once owned a Yankee & am very familiar with its "quirks".) Pilots familiar with today's 180hp descendants of the 1940's light aircraft are often caught unaware by the performance limitations of the original 65hp versions.

Wind shear is categorized and reported by its effect (energy increase or decrease) and its amount (airspeed change in knots). An energy increase shear (increasing headwind/decreasing tailwind) produces an airspeed/performance increase. We have all noticed the spectacular performance our aircraft gives when taking-off and climbing into a strong wind. As wind speed increases when we climb above the "ground friction" level, what we are really observing is the effect of a gradual energy increase shear during the time period of the "increased performance" climb. An energy decrease shear (decreasing headwind/increasing tailwind) produces an airspeed/performance loss. Remember that short field landing when "the bottom fell out" and we ended up with an arrival we didn't talk about for days? What happened? Probably an energy decrease shear. Ground friction slows wind speed at low levels. When the wind speed dropped so did our airspeed, resulting in a "high sink" arrival. Welcome to wind shear 101! This situation is made even worse when a crosswind component requires that we "decrab" the aircraft. The resulting drag increase from slipping flight compounds with the wind speed drop to make a very interesting arrival.

The severity of the effect of wind shear is measured by the percent of an aircraft's approach speed, not by its absolute value. Thus a 15kt airspeed loss (energy decrease shear) has a 25% affect on an aircraft with a 60kt approach speed and only a 10% effect on an aircraft with a 150kt approach speed.. Wind shear severity is increased when the shear has a vertical component, or down flowing air associated with it. This can be caused by local terrain, as well as convective activity. Cohesion causes the wind to follow the terrain just as it follows a curved airfoil surface.

Wind Shears are also labeled by the generating source. They can be caused by convective activity (Thunderstorm Micro bursts and Gust Fronts), low level frontal boundary

layers (frontal shears), strong inversions in the winter (inversion shear), terrain induced (mechanical shear), as well as the gradual shearing of coriolis effect and ground friction. Coriolis effect makes wind direction (in the northern hemisphere) shift to the right as we climb after takeoff and toward the left as we descend for landing. Ground friction makes winds decrease near the ground and increase as we climb.

To keep this article at a reasonable length, I think I will complete it in next month Flight Advisor column. We have completed the discussion of wind shear itself, so this seems like good break point. Next month we will look at the practical application of this information to the different types of wind shears. These are:

- 1) Convective Shear
- 2) Frontal Boundary Shear
- 3) Inversion Shear'
- 4) Mechanical Shear
- 5) Coriolis Effect/Ground Friction

The thought for this month is: The superior pilot uses his excellent thinking ability to preclude the need for his outstanding flying skills!" See you next month and as always, remember to **"Think Right to FliRite!**



EAA CHAPTER 613

Bill & Carol Morelli, NLE's
105 Brick Church Rd.
Fairfax, VT 05454



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FLY SAFE

May 2004

OFFICERS/COMMITTEE MEMBERS

President	Phone	Address	e-mail
Terry Griffin	878-7436	4160 Saint George Rd, Williston 05495	trg216@aol.com
Vice President			
Don Nowakowski	899-5163	146 Raceway Rd, Jericho 05465	nowakod@us.ibm.com
Treasurer			
Steve Couzelis	893-0029	9 Pine Harbor Rd, Milton 05468	flybuddy20@yahoo.com
Secretary			
Marge Butterfield	878-6337	721 No. Williston Rd, Williston 05495	airbear@surfglobal.net
Newsletter Editors			
Bill & Carol Morelli	527-6318	105 Brick Church Rd, Fairfax 05454	billvt@together.net
Scholarship Committee			
Frank Gibney	879 7419	1147 Sunset View Rd. Colchester 05446	gibneyf@aol.com
Young Eagles Coordinator			
Don Taylor	868 3809	11 Ferris St., Swanton 05488.	
Technical Counselor			
George Coy	868 2698	116 St. Albans Rd, Swanton 05488	george@gesoco.com
Assistant Tech Counselor & Activities Committee			
John Butterfield	878 6337	721 No. Williston Rd, Williston 05495	airbear@surfglobal.net
Chapter Web Site			
Dick Bayer	796-4432	20B South Main St., Alburg 05440	webmaster@grnmtsolutions.com