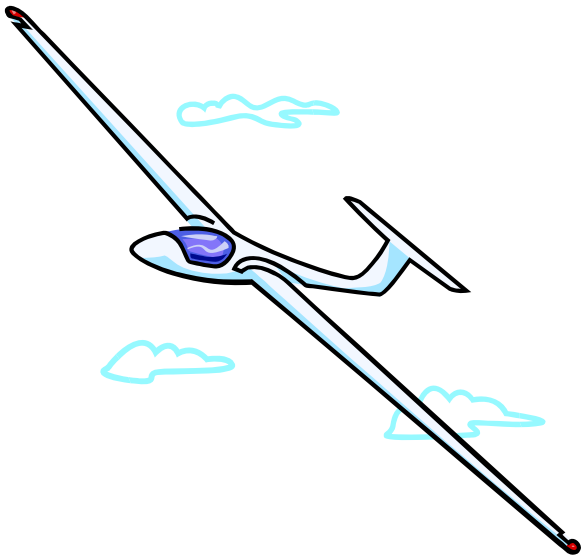
The Air Bubble

The Newsletter of The Chicagoland Glider Council

Est. 1938

- November, 2007 -

http://chicagolandglidercouncil.com



November CLGC Meeting

"WCSA Trip to Germany"

Don't Miss It!!

November 13, 2007 – 7:30 PM

During September Jim Short and Ray Konrath traveled to Germany to inspect a 1997 Schleicher ASK-21 which their club, Windy City Soaring Association, was interested in purchasing. They tacked a few extra days onto their trip in order to visit the Schleicher and Schemp-Hirth factories as well as visit (and fly) at the historic Wasserkuppe. Join Jim and Ray at the meeting where they will share their photography and impressions of the factories, the Wasserkuppe, along with the Sinsheim Glider Club and their fantastic 10 cylinder Mercedes-Benz powered dual drum winch.

Moved? New Email?

Please let us know to keep our database up to date. Send an email to JOHN@DEROSAWEB.COM or call 847-844-8776 Thanks!!

Landout retrieve, Sky Soaring Glider Club, Hampshire, IL
Location: Somewhere in Wisconsin

Aviation Quotes for the Month

"It's always better to be down on the ground wishing you were up in the air than up in the air wishing you were down on the ground."

"Keep looking around. There's always something you've missed."

"The probability of survival is inversely proportional to the angle of arrival. The smaller the angle of arrival, the larger the probability of survival and vice versa."

Soaring Turnpoint Database Has Moved

John Leibacher's wonderful turnpoint database has moved to http://soaringweb.org/. The old location http://soaring.aerobatics.ws was "lost due to incompetence of the registry.com folks who manage domain names". The mirror sites of: http://soaring.xinqu.net/JL and http://soaring.gahsys.com will also work.

CLGC on Wikipedia

The ChicagoLand Glider Council has an entry within Wikipedia, the on-line user-created encyclopedia like reference database.

http://en.wikipedia.org/wiki/Chicagoland_Glider_Council

Newsletter Contributions Anyone?

Please let us know what achievements are taking place at your club or with yourself can include them in future newsletters. If you have any information or photos and advertisement that you would like to have included in future newsletters please send them to JOHN@DEROSAWEB.COM or call 847-844-8776. Also if you have any articles you would like to write that are soaring related, please send them as well. Any suggestions at all are very welcome!

UPCOMING EVENTS

- 11/13/07 CLGC Meeting – Short/Konrath – "WCSA Trip to Germany"
- 12/11/07 CLGC Meeting
- 01/08/08 CLGC Meeting - Lewis – "Sports class nationals, thunderstorms and the safety finish rule"
- 02/16/08 CLGC Meeting
- 03/11/08 CLGC Meeting - Mike Greenwald – "Kites and Paper Airplanes"
- 04/15/08 Short/Schuur - "Joys and Intricacies of Vintage Gliders"

Twelve Commands for Soaring Pilots

Wolf Hirth (1900-1959)

1st Command - Whoever wants to become a soaring pilot must have a pure and strong desire to make the heavens a second home---as the sailor and the sea.

2nd Command - And as the sailor must know and love the elements of the sea, thus must the soaring pilot know and love the elements of the sky; it's winds, clouds, storms, and dangers.

3rd Command - You must fly for flying's sake.

4th Command - You must also have an eye and a heart for the beauty which flying opens up in the blue expanse of the sky with it's radiant mountains of clouds and the new strangely changed earth; otherwise your heart remains empty and you would be blind with seeing eyes.

5th Command - You must want to know the element of air better and better, to be an investigator eager for knowledge so that each flight leads to ever greater performances, opening up all possibilities of the air-ocean.

6th Command - You must love the struggle with the forces of nature and there must be an obstinacy within to be stronger than the storm and tempest.

7th Command - Never should you risk more than can be accomplished

8th Command - You should offer a pure being to the pure element, air. When you climb into your plane you should be in top form, bodily, mentally, and spiritually.

9th Command - As sailors their ships, and riders, their horses, you must know and control your plane exactly; you must know it's flying characteristics and limits of performance, and it's special inclinations and aversions.

10th Command - And as sailors carefully care for and maintain their ships, and riders, their horses, you must do the same for your plane. You must foster it, take care of it, and be fond of it as a living thing.

11th Command - You must gradually become one with your plane as if the wings were your own.

12th Command - One must be able to recognize soaring pilots not only by the white gull on a blue background, but also by the bright free glance, the ever helpful comradeship, and the complete lack of vanity and petty convictions. Then we can be found anywhere among the people and unite; we will form the beginning of a new nobility, and at the same time be the first citizens of a free, peaceful, and unified world.

AVIATION CLASSIFIED ADVERTISEMENTS

Anything to sell? Send an email to john@derosaweb.com

Effects of Horizontal Gusts on Total Energy Variometers

From: http://www.borgeltinstruments.com/Gusts.html

Ever overcooked a final glide after a low scrape and flown home at 120 + knots only to see the vario indicate 10 knot thermals everywhere?

Ever flown on a day when your vario tells you that there are 5 knot thermals and when you turn into them you find 7 knot sink? You probably put it down to turning the wrong way.

Considerable effort and thought has been expended on gadgets to tell you which way to turn, from thermistors and/or humidity sensors on the wingtips to wing bending sensors. All of these devices have problems which have prevented them from working at all or being widely adopted.

In fact the fundamental flaw in the concept of thermal detectors is that there may be no thermal (vertical air motion) at all when the vario indicates climb.

Here's what is going on.

Most variometers in modern sailplanes are Total Energy compensated in order to remove the effects of the pilot pulling and pushing on the stick. This would otherwise cause vario indications due to the glider rising and sinking as it is slowing and speeding up. These will mask the effects of changes in the air in the thermal you are trying to use.

The Total Energy compensation device is usually a pressure source which acts like a venturi even though it nowadays doesn't look like one.

It can be shown that the TE device must produce a pressure below the static pressure by the same amount that a pitot will be above static pressure at the same airspeed.

In flight the pressure at the TE Probe is the sum of the static pressure and the suction produced due to airspeed. At constant airspeed the TE probe acts like a static source and the variometer indicates the rate of change of static pressure converted to equivalent rate of climb or sink.

Note that the pressure seen by the vario changes with airspeed.
When we fly in a convective atmosphere there are all scales of turbulence from the very small (heat waves, basically) to thousands of kilometers in extent(synoptic meteorology) with all the scales in between.

Given that we know air goes up and down in the convective layer at 5 to 10 knots typically and that there is mixing at the edges of thermals and general turbulence in a convective atmosphere it is not surprising that as you fly through a given piece of air the air may not be everywhere moving horizontally at constant velocity.

The glider has very low drag in the direction of flight so takes a long time to actually slow or speed up due to these horizontal gusts and may fly from one parcel moving in one direction to another moving in another direction before it has done so.

This causes airspeed fluctuations which are relatively small most of the time (a few knots at most) and are unimportant to the pilot as far as airspeed control is concerned. A moments thought will reveal that airspeed changes will cause suction changes at the TE probe and hence a reading on the variometer. What is surprising is the magnitude of the effect.

If the air encountered by the glider has region where over a distance of a couple of hundred meters the horizontal gradient of the wind is +1 m/s per 100m a glider flying at 50 knots (approx 25m/s) will cover the 100m in 4 seconds and see it's airspeed increase by 1 m/s or about 2 knots.

The 1 m/s in four second change in airspeed is the same as that seen when you push the stick forward and change the flightpath gradient by 1 in 40 or about 1.5 degrees (point the glider straight down and the airspeed will increase at nearly 10m/s per second or 20 knots/sec - the rest is simple trigonometry). This is a small change but results in an additional sink rate of 0.625 m/s or 1.25 knots approximately.
In the horizontal gust case the glider where isn't actually sinking but continuing on its original flight path, the vario will show at 50 knots TAS a climb of 1.25 knots when encountering the gust in the example.

So far so good. Hopefully we are looking for lift better than 1.25 knots when the glider encounters such gusts. On very poor days when 1.25 knots is acceptable the air is usually less gusty. In your 1-26 or K8 you don't have much of a problem as you wouldn't fly much faster than this.

Now look at the case of the SAME AIR being flown through at 100 knots or 50 m/s. The airspeed change is now 2 knots in 2 seconds or 0.5m/s per second and to get this acceleration in a pushover we would need to change the flight path gradient by 1 in 20. This causes an additional sink of 2.5 m/s or 5 knots which isn't there in the gust case and so the vario reads 5 knots climb. Now we have a problem - the reading is comparable to the lift we might like to turn in and if we only look at the vario we might want to turn. What we will find is that after 180 degrees of turn we are going through the gust the other way and it causes the vario to read sink. Note that there has been NO vertical air motion here and you have wasted 30 seconds or so doing the turn and are lower than you started in the same place horizontally - maybe 100 feet or so lower in energy terms, which if the average rate of climb in the next thermal is 3 knots, costs you another 20 seconds.

The effect of the gust depends on the horizontal gradient in the air and for any given gradient causes a vario reading proportional to the SQUARE of the TRUE AIR SPEED.

Now in a modern glider 85 knots indicated or so isn't a very high cruising speed and at around 10000 feet this is close to 100 Kts TAS. You can calculate what happens at higher TAS.

Not only are the vario signals due to horizontal gusts comparable in size to the ones we are looking for due to vertical air motion but the durations are too. Slowing the vario causes you to lose information about vertical air motion too.

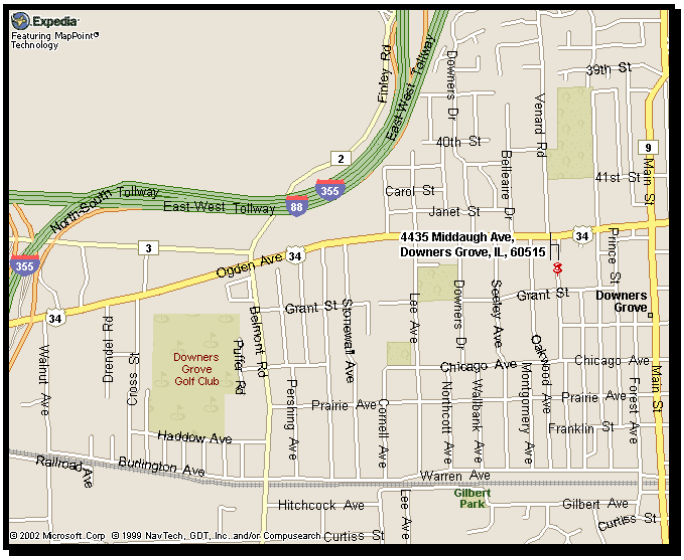
With current technology the only way to tell is to feel the vertical acceleration due to vertical air motion and mentally correlate this with the vario reading. If you get a vario reading with no vertical acceleration it's a horizontal gust. It's much easier to learn this with a properly compensated TE vario with reasonably fast response so that the vario doesn't have instrument or installation induced errors and the vario and "seat of your pants" are in phase.

I believe this is why some people find initial cross country flights difficult. You learn to fly floating around the airfield at 50 knots. Catching thermals on the run from 70 or 80 knots IAS is more difficult even if the vario system is working properly. The ability to distinguish between real thermals and vario readings caused by horizontal gust encounters is essential for modern soaring pilots. It is a problem that has crept up on us as gliders of better performance have begun to be able to cruise at higher speeds and variometers of fast response connected to accurate TE probes have come into use.

It is also a reason for using the "constant attitude" method of inter-thermal cruise through "thermals" you aren't going to circle in. If you are enthusiastically dolphining the changing G loads will mask the G loads due to real vertical air motion. There are other effects in TE vario systems due to changing G loads that cause them to work much better when you make smooth and gradual attitude changes. You might also not make yourself sick and you have more time to look around and actually see that steeply banked circling glider going up through your horizon.

Directions to the CLGC Meeting Hall

At Herrick Junior High School located in Downers Grove, IL.
Detailed directions are available at;
http://skysoaring.com/modules/gallery/directions



Grob 103 Landing on Runway 9
Windy City Soaring Association, Hinckley, IL

Skirting a bluff of skyscrapers, Dale May's high-performance Sisu I A rides a thermal above Chicago's lakeshore.

From the NTSB Aviation Accident Database

http://www.ntsb.gov/ntsb/query.asp

Glider Events for 2007 - Sorted by Make/Model

Event Date	Location	Make / Model	Registration Number	Event Severity
7/7/2007	Truckee, CA	Burkhart Grob Flugzeugbau G102 Astir CS	N132SS	Nonfatal
5/13/2007	Franconia, NH	Burkhart Grob Flugzeugbau G103	N39783	Nonfatal
7/1/2007	Centre Hall, PA	Burkhart Grob Flugzeugbau Speed Astir II	N176SS	Fatal
4/29/2007	Minden, NV	Burkhart Grob G102 CLUB ASTIR IIIB	N851BG	Nonfatal
6/16/2007	Wickenburg, AZ	Burkhart Grob G102 Std Astir III	N123KG	Nonfatal
5/10/2007	Minden, NV	Burkhart Grob G103 Twin II	N49443	Nonfatal
5/12/2007	Alamogordo, NM	Centrair 101C	N991JB	Nonfatal
4/13/2007	Llano, CA	Glaser-Dirks DG 505 Elan	N505TW	Nonfatal
10/6/2007	Hemet, CA	LET Blanik L-13	N510CS	Nonfatal
4/13/2007	Llano, CA	LET Blanik L-13	N101JJ	Nonfatal
6/27/2007	Warren, VT	LET Super Blanik L-23	N8022	Nonfatal
4/16/2007	Circleville, WV	Rolladen-Schneider LS8-18	C-GFPQ	Nonfatal
7/1/2007	Freehold, NY	Schempp-Hirth Discus-CS	N42CA	Nonfatal
6/16/2007	Minden, NV	Schempp-Hirth Nimbus-3DM	N374AM	Nonfatal
8/25/2007	Heber, UT	Schempp-Hirth Standard Cirrus	N62305	Nonfatal
10/26/2007	Salida, CO	Schempp-Hirth Ventus B/16.6	N36LB	Fatal
8/10/2007	Benton, CA	Schempp-Hirth Ventus CM	N41BM	Fatal
8/4/2007	Greensboro, VT	Schempp-Hirth Ventus-2C	N60LK	Nonfatal
7/5/2007	Bridgeport, CA	Schempp-Hirth Ventus-2C	N11YD	Nonfatal
4/29/2007	Castle Rock, CO	Schleicher Alexander GMBH ASH 26E	N123KS	Fatal
6/9/2007	Clear, AK	Schleicher ASK-21	N621CP	Nonfatal
9/12/2007	Morganton, NC	Schleicher ASW-24E	N24WR	Nonfatal
3/11/2007	Williams, CA	Schleicher ASW-27B	N273W	Nonfatal
5/19/2007	Lake Elsinore, CA	Schweizer SGS 1-26A	N2707Z	Nonfatal
7/22/2007	Windsor, VA	Schweizer SGS 1-26C	N2743Z	Nonfatal
7/21/2007	Big Flats, NY	Schweizer SGS 1-26E	N2768H	Nonfatal
7/20/2007	Northfield, MN	Schweizer SGS 1-35C	N135EX	Nonfatal
1/29/2007	Bath, PA	Schweizer SGS 2-32	N32BM	Nonfatal
8/31/2007	Morgan, UT	Schweizer SGS 2-33	N5731S	Nonfatal
1/6/2007	Immokalee, FL	Schweizer SGS 2-33	N5728S	Nonfatal
9/1/2007	Alliance, OH	Schweizer SGS 2-33A	N65832	Nonfatal
7/26/2007	Warrensburg, MO	Schweizer SGS 2-33A	N33950	Nonfatal
5/23/2007	Castroville, TX	Schweizer SGS 2-33A	N65804	Nonfatal
5/22/2007	Los Alamitos, CA	Schweizer SGS 2-33A	N65844	Nonfatal
2/9/2007	Jean, NV	Schweizer SGS 2-33C	N2438W	Nonfatal
9/2/2007	Hutchinson, KS	Slingsby Swallow Type T.45	N7476	Nonfatal
3/31/2007	Sylacauga, AL	Szybowcowy Zaklad SZD-36A	N6SZ	Fatal