AIRWORTHY

Newsletter of the Black Forest Soaring Society - Summer 2003

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TABLE OF CONTENTS: (clickable)

President's Message

Summer is here!

It's the time all soaring pilots look forward to, and here in Colorado we are very fortunate indeed. Colorado has some of the strongest soaring conditions in the United States with high 18,000 msl plus cloud bases, 10 knot plus thermals and long cloud streets setting up on the continental divide; long flights and personal bests are regularly experienced here in Colorado. This challenging "big air" is what drives the passion to soar for so many of us.

This "big air" can and does contain hazards for the inexperienced as well as the experienced pilot. Below you will find a few of my observations concerning the challenges of summertime soaring.

With strong lift comes strong sink; finding yourself low and deep in the mountains when just 10 minutes before you were having a hard time staying below cloud base at 18,000 feet is a sobering experience to be sure.

With a great cloud day we often see overdevelopment in the form of thunderstorms. As we all know many interesting items come from T-storms: lightning, gust fronts, micro bursts, virga, rain, strong lift and sink, tornadoes, extreme turbulence or as I like to call it "textured air". In its mature stage the lift can be shut down for a 50 mile radius. With zero lift and a 30 knot head wind you and terra firma will soon meet.

The summer heat can create a dehydration problem and our high altitude flying requires constant monitoring for signs of hypoxia; both issues are noted in many accident reports. The summer heat can cause the altitude density at Kelly Air park to reach or exceed 10,000 feet, creating a multitude of challenges for the glider pilot as well as the tow pilot in our trusty Pawnee during take-off and landing.

These are but a few of the many challenges that face the typical Colorado pilot during the summer soaring season. Our type of soaring is in my opinion the purest, most invigorating and rewarding form of flying. But, it does require a heightened sense of "situational awareness" and a constant monitoring of your environment for changes to navigate safely; no lolly gagging here.

The smartest decision any of us can make is knowing when to stay on the ground or get on the ground quickly. From personal experience I can tell you it is far better to be on the ground wishing you were in the air than in the air wishing you were on the ground!

Fly safely and fly well. See you at the airport!

Rick Culbertson - BFSS President.

Club News
As reported to editor by members

Letter:
Our club has been growing lately and part of the secret of our success is the friendly, helpful atmosphere around Kelly. Here's a letter Hans received from a happy visitor:

29 March, 2003

Dear Hans,

A note of thanks for giving so generously of your time during my recent visit to BFSS. It was a great pleasure to fly with you and to see the club so obviously refreshed in spirit - no doubt thanks to your efforts.

I enjoyed also making contact again with the world famous Colorado wave. It was a real thrill.

Here in the frozen North, we have spring, but still very wet ground. We expect to start flying in or around Easter, as we operate from a grass field.

Please give my best regards to all my old and new friends at Black Forest,

Fly Safely
Best Regards,

Tim wood

Miscellaneous:

This spring at the field tow pilot John Good called out over the radio "there's a B2 in front of me"! People swarmed out onto the field to see a strange black shape coming towards the field. It looked like a hovering hang glider. The odd thing was the lack of noise at it flew near. Rick commented that seeing the stealth bomber was the highlight of his week. You never know what entertainment you'll find in the skies over Kelly.

This spring also brought a huge storm to out area and shut down operations for a while. A few members went out to the field to check things out and took the following photo.

Photo: A Non Flying Day

Welcome new members and tow pilots:

Lee Kuhlke
Jason Depew
Tom Serkowski
Ancill F. Croskell
Neil Peterson - tow pilot
Melinda Hiigel - tow pilot
Rich Barclay- two pilot

Member Accomplishments:

Taylor Ellington soloed 6-1-03
Steve Johnson passed his private glider practical exam on 6-23-03

Owl Canyon Memorial Contest

by Clay Thomas

Photo: Clay also helps out with the towiong from time to time.

They warned me. Many people said, ”Don’t go to your first contest expecting to set the world on fire.” They were right. After receiving some serious encouragement from several club members to join the Owl Canyon Memorial competition, I finally agreed, knowing full well the consequences. Take heed: racing gliders can be dangerous to your financial health. Before you know it, you get caught up in the competitive spirit and want to spend a lot of money on the best equipment available.

The Owl Canyon contest proved to be a great learning tool for this novice competitor. Everyone was very helpful on the ground and even put up with my dumb questions at the start. Yes, the start cylinder is vertical, not horizontal. I still think it would be more interesting if it was horizontal but I don’t make the rules. Once you are in the air things get serious. (The weather was not good enough to have a contest the first day but we all went up anyway just to see what we could do.) I soon realized that I had never flown with so many gliders in such close proximity. That day, I was the last pilot to be towed up. Visibility was not great and I did not spot another glider for about 10 minutes. After that they were everywhere!

Dave Leonard, Tom Serkowski Dave Fanning, and Rick Culbertson headed east and most of us tried to follow. I figured I needed land out practice so I went about 24 miles

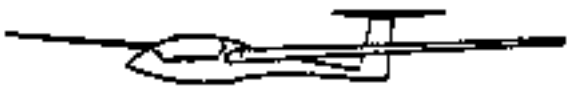
east. Meanwhile a large thunderstorm formed between most of us and Owl Canyon. Tom went around it to the north; Rick and Dave found lift in the middle of a lot of rain and got home. Dave Leonard and I landed about 20 miles out. Poor Dave had a bad day all around. That morning he had slammed his ear lobe in a truck door and tore the lobe. Fortunately the BFSS team doctor was able to patch it up with some super glue! That evening we all went out for some great Vietnamese food. You should have seen the looks on the faces of the other diners as Tom held a flashlight on Dave's ear while our fearless team physician did the patching! But I digress.

The beauty of flying east of Owl Canyon is that there is an abundance of places where you can land safely. We all pushed ourselves, knowing that a landout would be fairly easy.

On day two, the weather was good enough for competition. Dave Leonard set a conservative three turnpoint task of about 33 miles. A few pilots made it around twice, as required. Many pilots landed out. It was a marginal day but we all made the most of it and had fun trying. I found a nice field as did all others who landed out.

Day three looked promising but ended being scrubbed due to approaching thunderstorms. I believe many personal bests were set by pilots putting their ships away in record time as lightning cracked around us. The folks at Owl Canyon did a terrific job sponsoring the event. They put on a wonderful dinner Sunday evening. I had not been at Owl Canyon for 18 years and was impressed by all the improvements they have made in their facilities. A spacious clubhouse and hot showers for those that camped was a nice addition.

I would encourage all sailplane pilots to give competition a try sometime. I guarantee you will become a better pilot for it.



Glider Rides

An opportunity to turn someone on or off to aviation forever!
(How to give a ride and have someone come back)

This article is from a column written by Derek Piggot in Gliding with some minor editing and additions of my own at the end. CB Wilson

Quite a large proportion of people taking a glider ride for the first time have one flight and are totally put off soaring for good. How often have you heard the words "Yes I have tried it once, (Joe) took me up just after he got his license and I was sick". If you ask how that came about, it is not unusual to hear that they were shown stalls or even aerobatics by their enthusiastic pilots.

Unfortunately, even by the time most students go solo they have forgotten their own experiences on their first flight. They won't remember the very worrying sensations when the glider was banked over to make a turn and when at some moments it felt as though the glider was dropping out of control. If it made them feel sick it is unlikely that they would have taken it up as a sport.

A flight in good soaring conditions with powerful, rough thermals is the worst possible introduction for an inexperienced flyer. Pilots forget this when the weather is good and when there is the opportunity to show their friends the thrills and excitements of soaring and how they can climb thousands of feet. It is a different story to taking a power pilot up for a first glider flight because they are familiar with flying in small aircraft.

In my experience, introductory flights rarely, if ever, result in people being recruited as trainees unless they are given an opportunity to try flying the glider. Otherwise they go away having perhaps enjoyed their flight but without realizing it is actually quite simple to fly a glider and that they could probably learn to do it. A pure passenger flight seldom encourages anyone to consider learning to glide.

Every passenger should have the opportunity to try out the controls and fly the glider, and pilots who are going to do introductory flights for a club or commercial operation need training so that they do not put off potential recruits from flying. If you are serious about encouraging someone to learn to fly gliders, you must get them to do some of the flying themselves so they realize they could learn to do it.

Don't get talked into taking beginners if the weather is turbulent. Remember that if they are sick, they will probably never be happy in a small aircraft or glider again. You will have put them off for life. Choose an early morning or evening, or a fairly stable day when the conditions are smooth, and remember that continuous circling (thermaling) for more than a few turns can be very disorientating for a beginner. Usually this can be avoided by making runs through the lift to gain height and so lengthen the flight, and show how the

variometer and altimeter respond when you are in lift and gaining height.

Even a first flight of twenty minutes can be too long for many people. Remember it is far better that they wish their flight had been longer, than to have them wishing they were down on the ground half way through the flight.

Introducing the controls is a lesson, which is poorly done by many pilots and even experienced instructors. To be effective for a beginner the air instruction must be carefully planned. It takes care to avoid irrelevant detail and to choose exactly what to say to your passenger if you are to avoid making flying look complicated. Unless the person is very nervous I prefer to get the student to explore the movements for themselves, rather than by demonstrating and then getting them to repeat the movements.

I believe the aim should be to teach how to use each control rather than just the effects of the controls. For example, we can just show that when you move the stick forwards the nose goes down and backwards moves the nose up. But, if we can trust them to make small movements, we can take our hand off the control so that they can find out how much pressure, as well as how much movement, is needed.

It is difficult to learn much from following through on the controls. The student also needs to know not only their effects but how to use the control to get the result he or she wants. At this time when just experimenting with the control, we can also get across the need for a small counter move to stop the pitching, and the idea of getting back to the correct flying attitude from nose up and nose down positions. Most important, this way we test if they have really understood what we meant by putting the aircraft nose in the correct attitude.

At first many people do not understand what we mean by recognizing the position of the nose in relation to the horizon. Recognizing what is happening and learning to use the controls to make small corrections in attitude is a vital part of learning to fly. In fact you cannot fly a steady speed or learn to trim the aircraft unless you can recognize small changes in attitude.

You will notice that in the flying instruction at this stage I do not mention the ASI, an actual airspeed or any other instrument. This is because at this time I want them to concentrate solely on flying by attitude so that they have only one thing to concentrate on. If you do introduce the ASI early on, they will tend to rely on it and not on the attitude. Using only the ASI will result in "chasing the airspeed", a common problem. Once we can recognize and make small changes in attitude and hold them, then we can fly a steady speed. Note that I have not mentioned actual speeds, that will come after one or two flights when we will start to use it as a check that the nose is in the correct attitude.

It is impossible to feel the forces involved if the instructor is demonstrating with the

student holding the stick and trying to feel the movements. For this reason following through on the controls is not a good way to try to learn how to fly. Confusion is caused whenever the instructor makes a correction to a gust tipping us sideways. Our movements on the controls are too rapid for a student to follow or understand.

Whenever possible it is worth spending a few minutes before getting into the aircraft, telling them about the sensations which they may feel during their first few flights. Explain that everyone gets unusual and sometimes scary sensations on their first flights and that to minimize these you have chosen smooth conditions. Explain that whenever we lower the nose of the glider we get the sensation we call reduced g. This is what you feel for a moment as an elevator starts to go down. We also get it in a car if we drive at speed over a hump in the road and when flying if the aircraft flies through bumpy air, causing it suddenly to sink a few feet. But whereas in a car we usually can see the bump coming, in the air the bumps are invisible. This makes the unexpected sensations worrying or even a bit frightening at first. After a few flights our eyesight and other senses help us to recognize what is happening so that the sensation is no longer worrying.

Explain that in an aircraft we cannot make a "flat" turn like a motor car. We have to bank it over to turn. This can also be worrying at first but even after one or two flights we no longer get the feeling that it may tip over. Then as we learn to control the aircraft we gradually gain confidence and can relax and enjoy it all. It is important to warn passengers about these sensations so that they will be prepared to try another flight at a later date. It is easy for them to conclude that they are the only person experiencing them and that therefore they are somehow unsuited to flying. A visitor to a gliding site will get this impression looking around after their flight because everyone else is either an enthusiastic pilot or student and, of course, they are all smiles!

As soon as they have made a few movements of the elevator and ailerons to see what they do, it is time to start them making turns. At this stage, I am not concerned that they tend to under control and only apply the bank gradually. The aim is just to become familiar with the stick movements and establish that initial look out before making any turn. With almost all gliders, provided that the rudder is held firmly in the middle position and not allowed to move, very little adverse yaw occurs while small movements of the aileron are being used. Making the initial turns without using the rudder helps to establish the principle that turns are made by banking and not by applying the rudder.

It certainly makes it easier for a beginner if you leave the rudder until later, but if you cannot stop yourself from using it, do tell them to ignore your movements for the moment and explain that they will learn about using the rudder pedals later, or on the next flight. Before the flight, keep the talking to a minimum and explain things in the simplest manner possible. Most beginners have preconceived ideas and a common one is that to fly gliders they will need mathematics and knowledge of meteorology. Explain that this is not so and that it is all very simple and practical.

Its tough to follow Derek Piggot – but some additional thoughts from my experience…and others I've learned from [not to say I cannot learn more…which I do on every flight].

Remember, for many people, getting into a light aircraft is traumatic enough, let alone one with no motor. For you, this flight may not be a very exciting glider ride…for them if may be very different story. Its better the flight be "short" and having them want to go again then the opposite

This is "their" flight, not yours – your focus should be on making the flight as smooth as possible, medium turns at most, smooth stick movements. This is not an opportunity for you to practice your maneuvers and or demonstrate how great a pilot you are – not even boxing the wake.

Two aspects of a good pilot (or driver) – a) being safe, b) convincing your passengers you are.

If you elect to use humor to calm you first time pilot, be very careful what you say – they may not realize you are joking.

Give your first time passenger "permission" to feel uncomfortable. Its normal. One way to lose people is to make them think they are feeling fears that others don't.

A note on taking 'power' pilots for a ride –most likely they are flying an aircraft that does not require much stick and rudder coordination. You should prebrief them that on the increased need to coordinate rudders and stick – long wings, low slipstream effect over fuselage and tail. Invariably, they tell me something is wrong with the aircraft; that it won't fly straight even with a prebrief – especially airline and corporate pilots

Acting the part of a aviation ambassador requires more than stick and rudder skills. It does require that we empathize with the first time fliers. So act the part, leave them wanting a little more, give them veto power, handle objections/concerns, when they are an issue, project cockpit calm, let them know its ok to feel nervous, reschedule the flight if weather is not suitable and use humor appropriately.

Feel free to discuss taking a friend for a ride with any of the CFIGs or commercial pilots. They can give some additional tips. If anyone else has tips from their experiences, feel free to put on the BFSS list server!

A New Member Rediscovers Soaring

by Rick Ranson

After my first solo flight in a 2-33, I raised three (3) children, participated in climbing expeditions all over the world, raced my mountain bike, worked way too many hours at my law practice, and managed to get a lot older and a bit wider. That first flight was on August 29, 1975.

My second solo flight was in October, 2002. Jim Pilkington had demonstrated exceptional patience in his instruction and directions to me for the previous two months, and despite all of my efforts at demonstrating I was too old to learn to fly, he managed to get me to solo.

My memory of my first attempt at soaring is a bit faded and dusty. I flew at the old Black Forest Glider Port, located along Vollmer Rd. I remember having to be a bit careful for military and commercial aircraft because they were about 2 miles west at low altitude on final approach into the Colorado Springs Airport. The Club then was a commercial operation, open virtually everyday of the week. There were at least two full time instructors and a full time tow pilot. You had to pay in advance for services, and were required to keep at least $100 in your account.

The one item I do remember about the experience was the absence of any semblance of ground school. The focus was only on getting the new pilot to solo, and not to a license.

I'm not sure I was ready for the University of Pilkington Master Degree program in soaring. I have studied more for my FAA written exam, especially in the last two months, than I have since taking my bar exam 30+ years ago.

Because of the approach of my instructor, I feel confident about my ability to soar and fly, safely. I know the other instructors for the Club approach their instruction of students in a similar fashion. I firmly believe the instructor corps at the Club is its greatest asset.

I've had several opportunities to put my training to a test. In each of the situations, one involving serious sink and a significant head wind, and another involving sink and no lift a distance from KAP, I found that I knew what my procedure and actions should be, immediately. I was well trained.

Although I was not sure whether my interest in soaring really remained after my sabbatical of twenty-seven years, I quickly discovered my interest was very high. I found myself enjoying (even though my instruction time was 7/a, Saturday and Sunday for six months) my experience, and rearranging my work schedule so that I would not miss my

weekend instructional sessions.

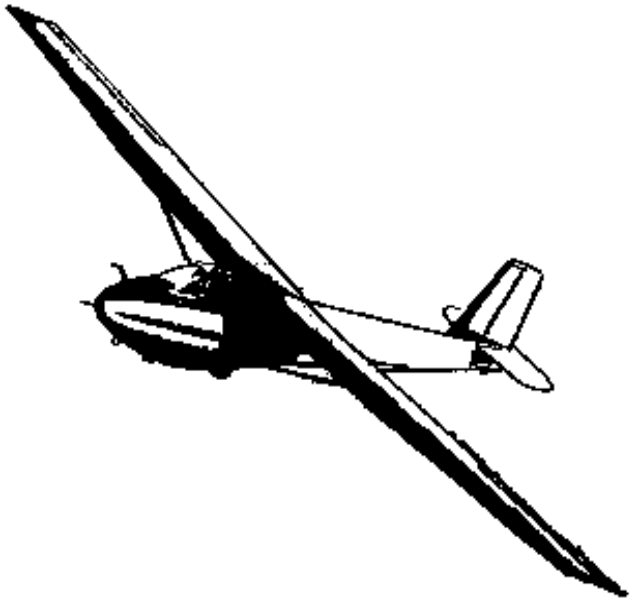
I volunteered for a place on the Board of Directors (much to the consternation of others) and have become involved in many of the administrative and management responsibilities required of the Club.

In March, 2003, I decided I was committed to this wonderful sport, and when the opportunity presented itself, I purchased an L-13 from Gunnison Valley Aviation. I remember driving over to Gunnison to pick it up, and my first impression. I wondered whether the paint job was a cruel joke. It didn't look like the sleek and clean L-23. Horst was the first to put all of the visual images together and said it looked like a John Deere tractor.

Immediately, I knew the name of the ship thereafter had to be The Deere. The Deere is now hangered at KAP and flying as a Club ship. Despite its midwestern farm appearance, The Deere flies very well, and is going to be the source of a lot of fun and enjoyment in the future.

My year as a student at KAP has exceeded anything I imaged in terms of fun, experience, socialization (thanks Annette for the BBQs) and satisfaction. The Club is blessed with many dedicated and involved people. Tom and Karen Serkowski spent three hours of their time the day before they left for their cross the country flight helping me assemble The Deere. I've approached experienced members with my inexperienced questions, and never had anyone not take the time to patiently answer. I continue to marvel at the ability of John Good to juggle the tow pilot schedule and keep us in the air.

I hope to continue soaring for many years to come, and despite my growing affection for The Deere, move up to something better in a couple of years. I'm hooked.



Lifted Index and K Index;
What They're Really Telling Us

By Bruce Carter, CFI-G/CCM

Photo: Bruce Carter standing in snow he no doubt predicted.

So, tell me…what do you really get when you dial up your very own 1-800-WXBRIEF?

Well, for starters, I want to cover one key issue right up front. If you have not really listened to "the latest Security Alert information" from the WXBRIEF magic voice's lead-in at least once, you won't really know if "Security Information Echo" is the same one you really listened to once before and, thence, can responsibly be stepped over for this visit. It's not smart to be deficient on the basics of the currently posted NOTAMS […Notices to Airmen…but, I know you know] on national airspace security issues. After proper attention to a Security Information message, you will, ever after, know wherefrom the current message is coming…and whether you should or should not listen for new information or a frontal-lobe recharge…'nuff said on this one for now.

Now, back to 1…tell me…what do you really get when you dial up your favorite 1-800-WXBRIEF? I mean, when you hit 2 on your trusty touch-tone for proceeding to "recorded summaries" and then 22 for the "thermal soaring forecast." The majority of

what the duty forecaster records for your edification (usually around 0700 to 0720 MDT each morning) is very straightforward. We find a basic description of the current synoptic situation. (Note…VERY basic…I see need for future articles sharing further insight into the hidden meanings to magic words such as "strengthening ridging" or "lee-side trough" or "passage of an upper-level trough.")

And then we get into numerics…max lift, trigger temperature, Denver's forecast max temperature for the day, time of first convection, time of overdevelopment (this is important!), height of maximum thermals, convective condensation level, Lifted Index, K Index, and then winds aloft.

Fine…OK…got it all, right? Let's get out there and slip some surly bonds…. Whoa there Pilgrim…wah-HAH…how really sure are YOU about that magic LI and K schtuff? Well, some other BFSS brothers and sisters have asked me to enlighten them on what those funny numbers really mean. Let's see if I can keep y'all awake with what follows.

One must be somewhat careful in seeking one's very own "K Index" explanation. Haphazard 'google-izing' can land you in the midst of all the Immanuel Kant, Nasir Khusraw, or Soren Kirkegaard you could ever philosophically imagine…or even an untoward projection of the most currently estimated planetary geomagnetic activity…but, alas, I digress.

What we're really interested in here is another numerical parametrization for the day's potential for thunderstorms. Simple really…higher the K number, the greater chance for TS, right?

For example, according to John Sturtevant's *The Severe Local Storm Forecasting Primer* (1995, ISBN 0-9650482-0-9), intended as a 'field guide' to forecasting severe local thunderstorm occurrence, the "K–index"

> "…represents the thunderstorm potential as a function of vertical temperature lapse rate [between] 850 millibars (mb) and 500 mb…, low-level moisture content at 850 mb [that is, dewpoint], and the [degree of moisture] at 700 mb…."

Or…let's put it this way…

$$(T[emp]_{850} - T_{500}) + Dewpoint_{850} - (T_{700} - DP_{700})$$

Don't like that? T – S – M – F ! [tough sledding, my friends….] Anyway, what this is trying to do is compare the measured temperature around 18,000 feet MSL (that's

your basic 500 mb) with the temperature measured around 5,000 feet MSL (850 mb). Consider this the "temperature lapse rate." Next, we'll also throw in a measure of how much moisture is available at that 5,000 MSL level. (That's nothing less to us pilot types than "thunderstorm fuel" for now…I'll explain this more in another article if you wish.) Call this "the boundary layer moisture." And finally, we want to compare those two preliminary "measures" with how moist or dry it is partway in between that high point and the low point down near the surface. And we'll call this the "700 dewpoint spread."

The 700-mb (about 10,000 MSL) temperature-minus-dewpoint spreads are chosen, as are the 500-mb and 850-mb measurements, NOT because those are the atmospheric levels where this convection magic always develops, but simply because these levels are all "mandatory" sounding levels; specified levels for measurement in a routine, twice-daily temperature and dewpoint and wind 'radio-transmitted-temperature-and-winds-sounding'…or "rawinsonde."

"All right…" you say, "But where's the beef?!"

What makes the K-index mean more for soaring than another index calculated to give us a quantification of atmospheric stability? It's all in the fuel content, Captain…that moisture content down low…the thunderstorm-fuel spill…as well as the moisture content (or, more significantly, lack thereof…) above the boundary layer.

A <u>moderately</u> high 850-mb dewpoint is the key starting point for widespread cloud markers to thermals. In our neck of the High Plains, that is the Palmer Divide (…and never forget, locality is a key consideration for the simple guidelines with which I'm attempting to 'infect' your busy minds…try to throw these bones out west near the coast, or back east at Caesar Creek, and they may laugh somewhat, so don't come back blamin' me!), if the 850-mb dewpoint from the Denver sounding—or, actually, essentially the surface dewpoint since 850 mb is around 5,000 MSL as, also, is the ground elevation of Denver's sounding site—is less than 40°F (~ 4 °C) cloud markers will be very high and slim to none over the plains, and scattered over the high country. Surface dewpoints from 40°F to 50°F (~ 4 to 10 °C) mean better markers over the flatlands. And thus far, altogether, we're not concerned about "overdevelopment" into TS…at least, not for convection generated out around 'the Kelly spread' on Palmer Divide. Buildups coming from the high country just to the west can be a very different species (and, yes, more to follow on this nightmare too, boys and girls, in another note).

But for now, simply remember this: with surface dewpoints getting up into the 50s Fahrenheit (~ 10 to 15 °C), we have bigger fish to fry (…yeah, some bite back!). And don't doubt this: with surface moisture so abundant that reported dewpoints are in the 60s (F) (~ 16 to 21 °C) the really big, midafternoon-stretching-into-evening "BIG fish" start chewin' your *tuchus* with numerous, often severe thunderstorms. Always have, always will. When conditions are "TS all quads…." discretion is the better part of valor, and

you're ever the wiser to gather in the hangars and lie a lot.

But—you ask— what about that range of dewpoints in the highest 40s (F) thru the 50s (F)…~ 8 to 15 °C? What makes the difference(s) in development of TS in that 'hood? The K-index can help us whole bunches here with its last factor, that "700 dewpoint spread" I dangled atchya so long ago and far away.

If there's 'boo-koo' moisture at around 10,000 MSL, then convective clouds are more likely to linger and overpopulate the countryside, spreading into widespread broken to overcast with rain showers. Not so good for our sort of soaring…but…consider this a challenging "opportunity to excel" in working weak and low lift for us…a.k.a. "a good day" back in Ohio. (See Schmelzer…he can show us the way to truth and enlightenment for such a European kind of day!) With moisture at 700 mb, the K-index's final ingredient will be somewhat lesser and, thus, the K-index itself will not be a high number. And related TS activity will most likely range from "not likely" (K at 18-19) to "isolated" (K at 20-25). With more moisture (remember, 'fuel') we can expect more thunderstorms even possibly "widely scattered" (K at 26-29).

If, on the other hand, it's very dry up yonder around FL 100, then the physics for thermals with copious boundary-layer moisture gets absolutely magical and TS shall abound! (For further details on the mystery physics, I'll need a beer to wash down all the "latent heat of condensation" that must season such hangar-talk.)

In summation on the K-index, start with our normally very standard lapse rate between the surface and 500 mb (18,000 MSL)…add high boundary-layer dewpoints straight up from Texas…then, finally, stay dry at mid levels with westerly winds aloft from the Great Basin or southwesterlies from Arizona…and WATCH OUT !! ...that K-index will be bouncing around 30+…guaranteed thunder-boomers…leave it in the box or git gone early!

Got some head-hurt out there yet? Go get a beer…next cometh the Lifted Index…the LI of life.

> Buoyancy is the force that causes thermals and newly condensed convective clouds to accelerate vertically due to a difference in density. You are urged to enjoy an excellent streaming video presentation in the *COMET (Cooperative Program for Operational Meteorology, Education and Training) Program's MetEd (Meteorology Education and Training)* package on "Buoyancy and CAPE" [http://meted.ucar.edu/mesoprim/cape/].
> The COMET has been established and superbly developed to provide education and training resources to benefit the operational forecaster community, university atmospheric scientists and students, and "*anyone interested in learning more deeply about meteorology and weather forecasting topics.*" The site houses online learning materials, as well as information on

other training and education activities. Keep your hip waders handy for some packages. Our starting point here—as well as all the quoted excerpts to follow—will be found in the "Buoyancy and CAPE" package (stashed under "Convection" on MetEd's front page):

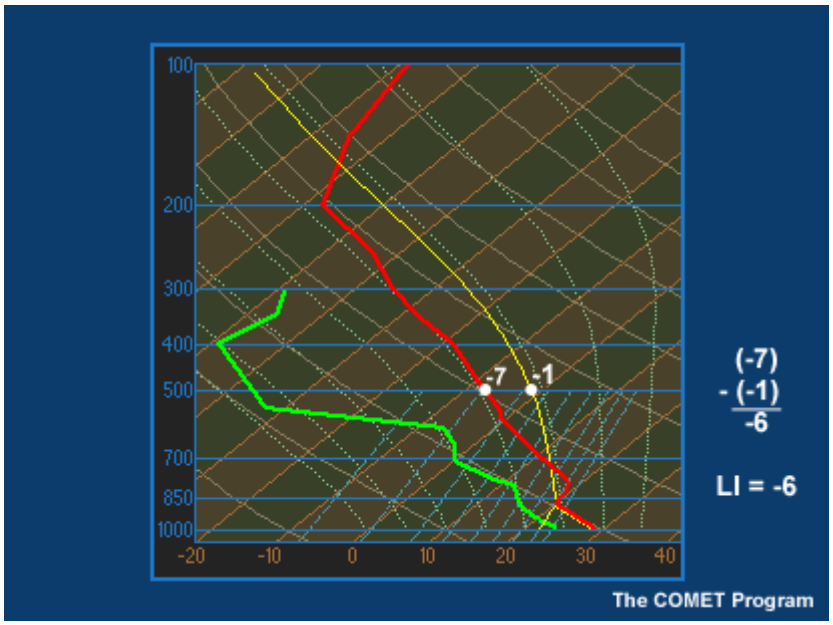
"When vertical wind shear is weak, buoyancy is the dominant control on convective updrafts and downdrafts. Stronger shears lead to interactions between the updraft and shear, acting to enhance or suppress vertical acceleration."

The amount of potential buoyancy in an area's convection can be quantified for our considerations somewhat (seriously…more to follow) with the Lifted Index…the LI.

"The best prognostic tool that forecasters can use to anticipate the potential strength of buoyancy processes is a thermodynamic diagram such as the skew T-log p diagram. By following appropriate parcel ascent and descent curves, a forecaster can use a skew-T diagram to estimate the potential strength of both updrafts and downdrafts for a convective cell.

"The [LI]… is calculated by lifting a representative parcel of air from the surface along the dry adiabat to its [level of free convection] LFC, then along the moist adiabat to a level aloft, commonly 500 mb. Then [you] subtract the temperature of the lifted parcel from the observed temperature at that level.

"When the lifted parcel is cooler than the environment at 500 mb, the LI is positive, we have negatively buoyant conditions, and the parcel will sink. Conversely, when the lifted parcel is warmer than the environment at 500mb, the LI is negative, we have positively buoyant conditions, and the parcel will continue to rise. LIs less than zero thus suggest the potential for convection, with LIs less than -4 increasing the potential for severe convection. LIs of -10 to -12 are not that uncommon in the spring and summer months over the central plains of the U.S.



> "When the lifted parcel is cooler than the environment at 500 mb, the LI is positive, we have negatively buoyant conditions, and the parcel will sink. Conversely, when the lifted parcel is warmer than the environment at 500mb, the LI is negative, we have positively buoyant conditions, and the parcel will continue to rise. LIs less than zero thus suggest the potential for convection, with LIs less than -4 increasing the potential for severe convection. LIs of -10 to -12 are not that uncommon in the spring and summer months over the central plains of the U.S.
> "The LI is an easy-to-calculate estimate of the convective potential. ***However, since it is calculated at only one level, there are many situations in which it may not properly represent the true convective potential. For this reason, LIs should not be used without also having reference to the full sounding*** [emphasis added]."

There's one more caution I want to add about the 'representativeness' of summary numbers proffered in the DEN FSS "weather brief." The rawinsonde balloon launched at 1200 and 0000 Hours Zulu Time (that's the Coordinated Universal Time [UCT] label for Greenwich-Mean Time [GMT] at the 0° Prime Meridian), translating for us into 0600 Hr and 1800 Hr MDT, is the best we have locally. But the DEN sounding should not be relied upon as sole gospel for the Palmer Divide's boundary layer or for the somewhat elevated and incredibly complex boundary-layer processes back to the west in the mountains where many cross-country types like to play. It's just plain different up on our hill as well as back up in them big hills. How different?

Remember that ALL of the parameters presented in the 1-800-WXBRIEF package from the DEN FSS… e.g., max lift, trigger temperature, Denver's forecast max temperature for the day, time of first convection, time of overdevelopment (this is important!), maximum height of thermals, convective condensation level, LI, K Index…are based, for starters, on the data from the DEN rawinsonde. The magic voice only shares the resultant parameterizations from their interpretations of—again—the ONLY balloon exercise we have locally. The rawinsondes are fundamental, but simply not what I will consider "sufficient" for a truly dependable representation of the atmospheric "infrastructure" in which we insist on playing our own fundamental, sustained, controlled, 'personed', unmotorized flight efforts. A sounding is a limited snapshot both in space and time. Our requirements for both measuring and architecting atmospheric stability and wind structures require inputs from a wider range of atmospheric science products. What're those supposed to be, you ask? Mesoscale models. Yep…right here in River City. And they start with 'M'…and that rhymes with "gem"…and they're really jewels! Tune in next time…I will try to share some understanding of Research Application Program (RAP) products from the National Center for Atmospheric Research and the wonder of BLIPMAP.

Never forget that you are not simply afforded opportunity of choice to check the forecast weather conditions as, perhaps, you feel it to be simply of interest before sallying forth. Rather, you're very "obligated"—required by Federal Aviation Regulations as essential and necessary—to be fully aware of what you should expect out there across the soaring hinterland. All in all…the 1-800-WXBRIEF can be a very good ***starting point*** [emphasis noted?]—a cornerstone, if you will—for the atmospheric foundations upon which y'all can build a day's forays from Kelly Air Park. But, remember Horatio, there are greater things meteorological between heaven and 1000K than you've yet dreamt of…. And let's be careful out there.

Questions on concepts or thoughts found in this article as well as—I HOPE ! —*requests and suggestions for other topics should be thrown over the transom to me at* cartersvilleco@earthlink.net