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e-WESTWIND

Ready to Launch- 18m Nationals Montague 2005

This Issue

Statement of Purpose

The purpose of the Pacific Soaring Council, Inc., a non-profit, 501(c)3 corporation, is to initiate, sponsor, promote and carry out plans, policies and activities that will further the education and development of soaring pilots. Specifically, activities will promote and teach the safety of flight; meteorology; training in the physiology of flight, and the skills of cross country and high altitude soaring. Other activities will be directed towards the development of competition pilots and the organization and support of contests at the local, regional, national and international levels of soaring. PASCO is the acronym for the Council. WestWind is the monthly publication of PASCO. Material may be reprinted without permission. The present board will remain in office until November 2005. Current dues are $25 annually from the month after receipt of payment.

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PASCO Board Meetings; Every 2nd Monday of the month 7pm, San Jose Jet Center
(off Coleman Av, west side of San Jose airport)
Contact Marc Ramsey (marc@ranlog.com) for details and directions.
Members welcome; please tell us you're coming.

REGION 11 GLIDER OPERATIONS

Air Sailing, Inc. Airport	Ty White	510-490-6765
Central California Soaring Club	Avenal Gliderport, 600 LaNeva Blvd Avenal CA 93204,	559-386-9552
Crazy Creek Soaring	18896 Grange Road, P.O. Box 575, Middletown, CA 95461	707-987-9112
Ely Soaring	Dan Callaghan P.O.BOX 151296, Ely, NV 89315 http:///www.elysoaring.com	775-720-1020
Las Vegas Soaring Center	Jean Airport, lvsoar@vegasnet.net	702 -874-1010
Mt. Diablo Soaring, Inc.	Rolf Peterson, Flt. Instructor rolfpete@aol.com	925 447-5620
Northern California Soaring Ass'n (NCSA)	Byron Airport, Byron, CA.	925- 516-7503
Owens Valley Soaring,	Westridge Rd., Rt 2, Bishop, CA 93514	619-387-2673
Hollister Gliding Club,	Hollister Airport – Hollister California, info@soarhollister.com	831-636-3799, 831-636-7705
Soar Minden	Minden-Tahoe Airport, P.O. Box 1764, Minden, NV 89423,	800-345-7627 775-782 7627
Soar Truckee, Inc.,	Truckee Airport, P.O. Box 2657 CA 96160,	530-587-6702
Williams Soaring Center	Williams GliderPort 2668 Husted Road, Williams, CA 95987 http://www.williamssoaring.com/	530-473-5600

REGION 11 CLUBS & ASSOCIATIONS

Air Sailing, Inc. Airport	Air Sailing Glider port, NV	Ty White	510-490-6765
Bay Area Soaring Associates (BASA) -	Hollister Airport, Hollister, CA;	Stan Davies,	408- 238-2880
Central California Soaring Club	Avenal Gliderport, Avenal, CA.	Mario Crosina,	559 251-7933.
Crazy Creek Soaring Society (CCSS)	Crazy Creek Gliderport, Middletown, CA..	Roger Archey,	415 924-2424
Great Basin Soaring, Inc.	2312 Prometheus Court Henderson, NV89074	Terry W. Van Noy	
Las Vegas Valley Soaring Association	Jean Airport, NV, P.O.Box 19902, Jean, NV 89019,		702-874-1420
Minden Soaring Club	P.O. Box 361, Minden, NV 89423		
Mount Shasta Soaring Center	Siskiyou County Airport, Montague, CA	Gary Kemp,	530-934-2484
Nevada Soaring Association (NSA) -	Air Sailing Gliderport, NV.	Vern Frye	775 825-1125
Northern California Soaring Association (NCSA)	Byron Airport, Byron, CA.	Mike Schneider	925 426-1412
Silverado Soaring Association	739 Pepper Dr. San Bruno, CA 94066;	Paul Wapensky WapenskyPJ@mfr.usmc.mil	650-873-4341
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Pacific Soaring Council	http://www.pacificsoaring.org
Air Sailing Inc.	http://www.airsailing.org
Jim and Jackie Payne - FAI Badge Page	http://home.aol.com/JPAviation
Bay Area Soaring Associates	http://www.flybasa.org
Central California Soaring Club	http://www.soaravenal.com
CRAZY CREEK SOARING SOCIETY (CCSS).	http://crazycreekgliders.com
LAS VEGAS SOARING CENTER	http://www.lasvegassoaring.com
Minden Soaring Club	http://www.mindensoaringclub.org
Mount Shasta Soaring Center	http://www.craggyaero.com/mssc/
Northern California Soaring Assoc.	http://www.norcalsoaring.org/
RENO SOARING FORECAST	http://nimbo.wrh.noaa.gov/Reno/rnosafrno.htm
Silverado Soaring, Inc.	http://www.silveradosoaring.org/
SOAR HOLLISTER	http://www.soarhollister.com/
Williams Soaring Center	http://www.williamssoaring.com/
Valley Soaring Association	http://www.sonic.net/~pjkelly/vsa.html

Editorial

We have many 'new happenings' over the summer; the world soaring Grand Prix is under way and Soar Truckee have their own pioneering version, completing their second event this Labor Day. The ever popular Kenny Price (of Williams's fame) is now happily married to Suzanne Hinkle, They were married Saturday Aug 6th during a beautiful lake side ceremony at Merlo Park in Sterling City.

We have some notes on upcoming events and behind the scenes action at PASCO, including the annual banquet and seminars, this issue was a little later than originally intended so we could include the banquet details and speakers list. I have enclosed a good article about Coriolis Force I found on the web; the key to understanding the basic dynamics of atmospheric winds and pressure system development; I was inspired to include this as I was reviewing a classic meteorology text the other day and its explanation of this fundamental driver of all our weather behaviour was appallingly scant. Also included is the latest update from Leo Montejo about the airport situation at Minden, one of the jewels in our region 11 crown, and a brief summary of the 18m Nationals at Montague. On a more serious note, as the summer season draws to a close, with stories of great flights still to be heard, contest accomplishments in the bag and the wind-down of the season, we are still plagued by safety problems.

Once more we have fatalities to report in the region. We lost Maria Faber at AirSailing in a tragic stall-spin accident, and Mark Navarre in the southern Sierra Nevada over July 4th weekend. There is more information on each of these accidents later in this issue.

While all deaths in our sport are tragic, those who take people we know affect us most deeply. I knew Mark and raced with him several times, and those who knew him will feel his loss keenly; he was an upbeat, enthusiastic pilot and loved to fly, loved the competition scene and was liked by all.

While words are always inadequate to express our sense of loss and sympathy to Mark and Maria's families, the evidence of friends lost while soaring flies in the face of our own continued participation in an activity that is undeniably dangerous and very unforgiving of error. A serious accident can happen to anyone and all it takes is the wrong combination of inattention or risk-taking to end up in a bad situation.

For many understandable reasons, this is difficult to talk about but the list of tragedies is too long to allow us any luxury of fatalism or denial and still have the expectation of surviving.

Every time we lose someone this way I am freshly reminded that this new death must have been somehow avoidable, that not only the deceased but all the people in their lives are now affected by some momentary lapse of judgement or awareness, and that we all have a responsibility to each other and those that love us not to suffer the same fate. I do not believe in fate, or luck in any form of aviation. I think it is crucial for all of us as pilots to personalize this aspect so we can elevate it to its appropriate importance, and emphasize our strategy for decision making- our own very personal safety net.

I now have a string of friends and acquaintances I have lost over the years to 'out of the blue' soaring

accidents; all of whom were experience glider pilots, airline pilots or instructors, all of whom died in regular cross country soaring, not in competition. Joe Findley, Gene Carapetyan, and now Mark, are those lost friends.

Several years ago Katrina and I hiked up to Joe Findley's crash site near Spooner summit just before his memorial service (a tragic and emotional time) to try and come to terms with what might have happened to him, and to figure out if this soaring game was really something I could afford to keep doing. The answer was yes, but a conditional one. The crucial importance of adding margin and good judgement was forcibly brought home to me, that there was no inherent guarantee of not having an accident and that as pilots we depend critically upon our judgement and mental faculties to keep us out of trouble; that crossing the fine line of having several options to only having one (or no) options leads to inexorably to an exponentially deteriorating situation.

My inward commitment to stay flying was that (with renewed vigor) I would always make decisions that left me with options. As a general statement, inattention, complacency or putting yourself in a position where there's no way out if things turn to worms has no place in the decision process. This is no tired platitude; making decisions that leave you options will do more than almost anything to keep you alive while flying a glider.

I've included in this issue what I think is one of the best safety articles I have ever read; It is written by Bruno Gantenbrink, a German team pilot and veteran of many World Championships. I commend this articulate, sensitive and thoughtful article from one of the worlds top glider pilots to anyone and everyone. I believe it is required reading for anyone in soaring, independent of level or experience, because the principles behind it apply to all levels. I hope after reading it that you will agree.

Stay rational, stay alert, stay safe.

Kindest Regards, Peter.

2005 ANNUAL PASCO SEMINARS , BANQUET AND AWARDS PRESENTATIONS

Western Aerospace Museum, Oakland, Saturday Nov 19th

http://www.westernaerospacemuseum.org/

9am start
Cocktails 6pm,
Dinner 7pm
Speaker to be Announced

8262 Boeing St, Bldg 621
North Field
Oakland Int. Airport
1-510-638-7100

Exit Hagenburger Rd off I-880

RSVP/Contact Marc Ramsey
marc@ranlog.com

Seminar Series 9am-5pm

Including;

The Building of the HP-24
(Bob Kuykendall, with fuselage)

History of Region 11 Soaring
(Bernald Smith)

TAGARS!
(Sergio Colacevich)

Instructing in a Club Environment
(Monique Weil)

How to Survive your first Competition
(Peter Deane)

PASCO Town Hall meeting
(Marc Ramsey)

Fatality at AirSailing; Maria Faber
(Terry Duncan)

I am very sad to tell you that Maria Faber died this afternoon in a stall/spin accident at Air Sailing. She was flying her Russia.

I understand that the stall spin occurred while Maria was on a high final for Runway 21. Lee had towed her to Red rocks, after Maria released he returned to tow the 2-33 -- he saw her impact from the tow plane with the 2-33 on tow, but was unclear on how/why the spin occurred.

Maria had her first glider flight of the season last Friday, on the last day of the (Women's Soaring) seminar -- according to Lee she also flew Saturday, Sunday and Monday. Lee heard second-hand that she had a 3 1/2 hour flight yesterday that she was very happy with. She was staying at Air Sailing for the badge and record camp this week, and the Cross Country Camp.

Mark Navarre accident in the Sierra Nevada (Cindy Brinkner)

Friends: This has been a torturous week for us. Mark Navarre went soaring with several friends on Sunday, July 3, and discontinued his position reporting shortly after 3 pm. It was a normal, nice summer afternoon on the Sierras, working altitudes of 14 ~ 15,000 msl were possible.

The other pilots returned home to California City by 6 pm, and no one had heard from Mark. We tried radio relays on 123.3 and 123.5 from ATC asking pilots to call down while transitioning. No answer was received.
From Cal City, three pilots departed in a Mooney to the area to give Mark a chance to signal to their overflight. Based on our phone request, the Pawnee from Santa Ynez, based at Bishop that weekend also searched for the hour before dark. Inyo County Search and Rescue was notified about 8:30 pm, and they prepared to start searching early Monday.

Monday morning three aircraft flown by glider pilots (Pawnee, Mooney, Bonanza) and a Taifun motor glider searched the area between Onion Valley and Coyote Flats, before Inyo S & R required them to clear some airspace while the CHP helicopter worked. Sheriff's personnel found the wreckage and confirmed Mark's passage at approximately 1pm.

The fact that Mark gave regular position reports, and was seen by a southbound pilot, limited the search area to be pertinent. No matter the speed of the response, Mark was lost immediately. The glider impacted steep terrain at 11,700 msl, south west of Coyote Flats. We have no access to any flight recorder data, so it is impossible to conjecture what may have happened. If data becomes available later, we will attempt to pass useful knowledge to soaring pilots. There was no unusual weather, it was CAVU with scattered cu at ~ 15,500 over the middle Sierra. We still do not have access to the exact crash coordinates, so speculation is pointless.

The approximate site was later over flown for two hours by us, without locating the glider against snow covered background. The only pertinent comment that can be made at this time is for soaring pilots to provide more separation between themselves and terrain in all conditions, acknowledge incremental development of skills and respect personal limitations.

The family eagerly wishes the attendance of flying friends at Mark's service, and a family gathering to follow.

With great sadness,

Cindy Brickner and Marty Eiler, Caracole Soaring

Bruno Gantenbrink: Safety Comes First

Translated by David Noyes, Edited by Beth Langstaff

My talk was advertised as a banquet speech. What does one expect of such a presentation? Something pleasing, something educational, in any case, something positive. Nothing which disturbs one's picture of gliding. In this sense, my talk is not a speech suitable to a celebration. What can one say that is celebratory of safety? This presentation may frighten you, provoke you, or make you think. All of these reactions are to be expected. It does not matter to me whether what I have to say will cause negative or positive headlines in the press. If somebody comes to me afterward and says, "Is it really necessary for you to air our dirty linen with press present and strangers listening?" It will not concern me in the least.

If one were to gather together everything about soaring that was worth knowing, in my opinion, it would be divided into four chapters.

The first chapter would concern itself with the freedom of soaring flight. We would describe the majesty and beauty of gliding here. We would also have to consider the factors which endanger our freedom of the skies. The increasing number of senseless rules caused by an ever-growing number of aircraft and pilots make things harder all the time and in themselves give us much to consider. We should also define our relationship with the environment in this chapter.

For the next chapter, the title could read: "The Opportunity to Glide." We would have in here all of the organizational questions that have troubled us in recent times. Besides organizational problems, how do we create larger and smaller organizations? How should the training be organized? What should the licensing and examination regulations look like? In this chapter we should also look at the cost and financing of gliding because, after all, we have to be able to afford our sport.

A third chapter would handle the skills needed to fly gliders. One would then assemble all of the knowledge we need to pursue our sport, including aerodynamics, meteorology, soaring theory, flight techniques, and many other things. The material in the first three chapters alone takes up 95% of our attention, not to mention our activity. At least that's what it looks like to me, when I think back on the talks given at this venue in recent years.

That doesn't leave much time and attention for the 4th chapter which deals with the question of how we survive our sport and is labeled "Safety." My feeling is that these four chapters should be about equal in size. But equal treatment of these subjects is not a given. The degree to which we neglect the subject of safety leads me to the hypothesis that we have a problem with it. Some of you are probably thinking, "He exaggerates. He's painting a black picture and that's understandable because he wants to make a strong point. Therefore he is blowing it out of proportion to make it look important. We all know that there is nothing in this world that doesn't have some degree of danger. Even gliding is not without it. But we all know that the most dangerous part of gliding is the drive to the glider field."

Everybody has said this or heard it said. I remember the first time I heard it. I was a 14 year old kid who had just been taken to the glider field by my father. Naturally, he asked whether there was any danger for his son in learning to fly and he received that same answer from an instructor in my presence.

If that answer were true, or even nearly true, then there would be no flight safety problems and there would be no use in pursuing this theme any further. We could stop the presentation here and go on to other things. It's worth the trouble, however, to take a closer look at this statement to see if it is really true.

That sentence,
"The most dangerous part of gliding is the trip to the glider field"
is the dumbest, most ignorant saying that has found a home in our sport.

I want to take up the question of the truth of this statement in a subtle, perhaps even macabre way. I will forego the usual comparative statistics stated in terms of accidents per 1000 take-offs or deaths per 1000 flight hours given out by the German equivalent of the FAA. These statistics don't tell us much. They don't express what is too much and what is too little. How many deaths per 100,000 take-offs are too many? What number would be acceptable? Such comparative numbers don't really get under your skin. I can't impress you with those numbers. I would like to weigh the sentence, "The most dangerous part of gliding is driving to the airport" against my personal statistics.

To do this, I have made up three lists. The first list is the names of comrades that I have lost in flying. The second list is the names of friends that I have lost through accidents on the way to the airport either in a car or on a bicycle. And finally, to make the picture complete, the third list contains the names of glider pilot friends that I have lost in any kind of traffic accident anywhere.

The first list, of friends lost flying, contains about 30 names. I will mention only the most prominent. Just during the last year in Germany there were: Helmut Reichmann, Ernst Peter, Hans Glöckl, Georg Eckle, Horst Kall and then tragically just a year later, his wife Marlis Kall. From Austria: Rudi Göbel and Alf Schubert. From Belgium: Prof. Sander. From France: Sidot and Daniel Quemere, chief flight instructors at St. Auban. From The Netherlands: Kees Musters. From South Africa: Heini Heiriss. As I said, these are just some of the more prominent names.

Now the second list: there is no one. I haven't lost any friends on the way to the airport. And I was somewhat surprised to find that for me, the third list of pilot friends whom I have lost in traffic accidents is also empty.

In the last 20 years we have lost 3 world champions including Harro Wödl, who is included even though I didn't know him personally, from the total of approximately 30 world champions. In the last ten years, we have lost three former German national champions out of the less than 30 we have ever had. It would appear that you have about a 10% chance of joining them. That should raise the hair on the back of your neck.

My personal statistics lead me to believe that glider flying is at least 30 times more dangerous than driving a car. And since every glider pilot has a driver's license, gliding is 1000 times more dangerous than the drive to the glider port. I admit that there are different statistics in different types of flying. To my mind, training is the least dangerous and cross country is more so. The most dangerous is probably competition flying. But even at that, the safest activity among these is only relative, since training for everybody is only a temporary period on the way to cross country and competition.

With all that I know and understand about gliding, I believe that the sentence, "The most dangerous thing about gliding is driving to the airport." is the dumbest, most ignorant thing that has been said about our sport.

"In the stronger language used by my kids,
Gliding is bloody dangerous!"

Some who use this saying are simply ill-informed. Those who know better but use it to pacify the public or to put things in a positive light for the press, are reckless. Actually the opposite is true. It is more dangerous than anything else that I do or know about in my life. Why don't I quit? A good question. One reason I don't quit is because it affords me more fun and pure joy than anything else I could imagine.

There is a second reason which is more decisive and that's why I'm giving this talk. I believe that gliding is not intrinsically dangerous. **It is the way it is practiced that makes it so**. It could be much

less dangerous if we were more aware of its dangers and behaved accordingly. Sadly, we don't do this.

I am very aware of how dangerous gliding is and take care to act on this awareness. Because of this, I hope to beat the odds. If I didn't have this hope, if gliding were as dangerous as the odds make it appear, then I would quit immediately.

Almost all the soaring friends I have lost have been killed due to "pilot error". Some of these errors have been silly little things, the simplest kinds of carelessness with fatal consequences. They died because at the critical moment, something else was more important than flight safety.

If soaring is to become less dangerous than it is today, simply taking different precautions won't do any good. The basic attitude must change. And the attitude can only change when we realistically evaluate the danger every time we fly. That is why I have fought against the thoughtless use of the saying that "the most dangerous part of gliding is driving to the airport."

Anyone who begins gliding with this philosophy does not appreciate the danger into which he enters. When the pilot believes this saying, he doesn't have to think any more. Neglect kills safety consciousness.

The prevalent attitude is one of lulling comfort with the danger suppressed. Unconsciously, you know something is there, but you don't want to talk about how dangerous it is. Why is the realistic consciousness of the risks so important? **Because our strategy depends on how we evaluate the danger.** There is no activity without risk. Even if we don't get out of bed in the morning, we could think of a scenario in which something bad could happen. But we don't worry about such things. There are two very different kinds of danger. First are the ordinary everyday risks and second are the really dangerous things. People behave quite differently depending on which of these types of dangers they perceive are present.

There are the ordinary dangers at home, in sports, and games. For example, everyone knows that every year a certain number of people are hit by falling trees. In spite of this, people walk through the woods every day without fear of being hit by a falling tree.

It is unnecessary to work hard at avoiding the everyday dangers. You trust to luck because these dangers are so rare. It is extremely rare to be hit by a falling tree. On the other hand. There are the really dangerous and more probable things. There are ways to avoid these. The strategy for avoiding these real dangers cannot be to assume that "they won't happen to me, but they may happen to someone else." The strategy must be to avoid those dangers right from the beginning or, because that is not 100% possible, to minimize them to an acceptable level.

It is necessary to realize that these dangers are not rare but are actually rather likely. The dangers in gliding are relatively high as I have illustrated by my macabre statistics. Special care must be taken to survive our sport.

I often have the impression that gliding is put in the same category as everyday traveling. The idiotic saying that "gliding is not as dangerous as the trip to the airport" makes this clear. Our consciousness of danger is under-developed. We don't think that something might actually happen to us; others maybe, but not us. We have flight safety inspectors to insure safety and relieve of us of thinking about the subject. We can think about other aspects of gliding.

What the safety inspectors tell us is, at best, secondary knowledge or advice. We have to change this. We must concern ourselves much more with the safety issue. It is not simply a rumor that our safety consciousness is under-developed. Let me illustrate this by some examples.

I remember the German Nationals at Buck burg in 1990. We had a variety of starting methods. The open class used a start photo and unlimited start gate height. The others used a start gate with a 1000 meter upper limit.

One hot day, we went to over 2000 meters on the nearby Within Mountains. This was the beginning point for the open class who wanted to start as high as possible. That was already dangerous enough. There were 35 open class ships circling in one thermal. Anyone who knows what happens in the top part of the lift when the thermal hits its limit will understand me. When there is just barely lift on one side of the circle, you can hit a little sink on the other side and the air is very turbulent in this situation. This last part is particularly uncomfortable because the aircraft change altitude with respect to each other quite often.

The reason for 35 open class ships waiting there to start is obvious. But what were the 80 other standard and 15 meter ships doing up there? That remains a mystery to me. The only thing they were doing up there was waiting for the start gate to open 1000 meters lower. And when it did open, they all dove down with air brakes open at 110 knots.

The fact that the standard and 15 meter pilots squeezed the last 50 meters of height out of the

thermal can only mean that something was wrong with their thinking. I say this because there was no advantage in their being so high and putting themselves in such danger. Circling in such a crowded gaggle is something to avoid as much as possible. Before the beginning of the task, the general rule is not to put yourself at a disadvantage. One is supposed to "keep your powder dry" until it is time to begin in earnest. The standard and 15 meter classes that gained every possible bit of altitude had not only no use for it, but gave themselves a severe disadvantage since it took a relatively long and extreme dive to get down to start gate altitude. It would have been smarter to stay close to the start gate where the competitors could be watched and a quick start could be made. 1300 meters agl would have been a much better position. The standard and 15 meter pilots had done something which was not to their advantage and unsafe at the same time.

I call that inadequate safety consciousness; they simply didn't think. It would have been more sensible to circle at 1400 to 1500 meters in the lift and spread themselves out a bit. In any case, going to the top was neither smart nor safe.

A second example is something which happens over and over at contests. The tasks are chosen such that there is opposing traffic or all classes are sent on practically the same course. During the first two or three days they seem to avoid this but after a while it creeps back in. Something isn't right here and it should be easy to fix. Since the conditions for all classes are the same, even taking into account the weather forecast, there is nothing to prevent separating the classes so that they wouldn't even see each other during the day. The task setters seem completely unaware of the dangers involved in having large groups of gliders flying together.

The third thing I want to mention is a positive example. Last summer, at the US Nationals, I saw something that impressed me very deeply. Every morning at the beginning of the pilot's meeting there was a Safety Talk. Each day someone was picked to give a 10 minute safety session the next morning. Sometimes they were rather unpolished - not everyone is a born public speaker. But they were all plain speaking people who were pilots entered in the contest. They had all been around and they all had something worthwhile to say. I was very impressed by the good thoughts that were presented. The audience listened attentively and seemed interested in the topic of safety.

Why doesn't this happen at our contests? During the briefings at our contests, we talk about the points in the hand-outs that people are too lazy to read beforehand. I can't remember ever having spent any time talking about safety at one of our contest briefings.

I am definitely not a person who preaches safety all the time. Nor did I invent the topic of safety. I know my own limitations, but I also know what I'm talking about. I have just barely lived through the past 20 years with much luck. Normally, about 80% of the people who have the kind of accident I did die. More than half of the rest are so badly injured that life is not much fun anymore.

You only have so much luck during a lifetime. Since the accident, I try to be careful. I believe that I am considerably better, certainly not perfect, but better. If I didn't believe that, then I would quit gliding immediately out of consideration for my family, my business, and myself.

Those who have flown with me in competition know that there are certain things that I will not do. I remember a situation during the 1985 world comps in Italy when I was flying with Klaus Holighaus. He was a little higher than I and we were having a problem. He flew out of the light rain in the valley over a pass with a turbulent crosswind. We really didn't know which way the wind was blowing and we could have been flying into a lee wind off the pass. Our height over the pass was at best 60 to 70 meters and we had about one to two kilometers to fly to get to the pass. Even though the passage appeared to be possible and Holighaus was practically through, I turned back into the bad weather. At that moment, I said good-bye to the ranks of pilots who seriously considered themselves in contention for the world championship title. I was never sorry for the decision I made.

There was a 99% chance that I could have made it through the pass. Klaus was a little higher and made it. I would have made it if nothing unforeseen had happened. However, only the smallest thing needed to have gone wrong such as flying a little to the right or to the left of Klaus' path. That can make a big difference in a pass. Then I would have been stuck up there over the unlandable pass. I'm quite prepared to take risks in normal gliding and even higher risks in competition flying. At first glance, this statement is confusing. But if you don't allow yourself some risk in competition, then you might as well quit gliding altogether because gliding is more dangerous than not gliding. If I'm willing to take the risks of gliding in the first place, why not the additional risks of competition? What is important is something quite different. Namely, whether what I choose to do is worth the risks involved. What is the degree of risk? What can I do to minimize these risks? The short and simple conclusion is that one can question exposing oneself to the danger of all soaring, including the drive to the airport. All of it is more or less dangerous. In fact

everything is more or less dangerous including all other sports. So what's to be done?

Everybody has to develop a safety strategy for himself. The simplest is to eliminate the risks that are completely unnecessary. For example, circling in gaggles unless absolutely necessary. In addition, we should be aware of the risks we do take and try to reduce them as much as possible. We should set risk limits for ourselves and not go beyond these limits. We should be permanently watchful. He who pays attention and watches out for the simplest things can avoid catastrophe.

In any case, if you have a risk-conscious safety strategy, that is a much more successful method of surviving this sport than to simply hope that you have more luck than your friend who takes a hit.

The Soaring Grand Prix;
A new type of competition for gliders.

The Grand Prix is a new type of competition for gliders, both more spectacular and more easily understood by the public than conventional competitions. It has to be said that the latter are of little interest to the public and the media because they are difficult to follow. It is true that most of the time, the gliders are working far from base. On top of that, even in speed races round a pre-determined course, the first pilot to cross the finishing line is not necessarily the winner of the day as the competitors can choose the moment to leave. Finally, results based on a points system, arrived at by complicated formulae, often published long after the pilot arrive back. Because of this, competition contributes very little to the promotion of our sport.

The French Gliding Federation has tried to remedy this state of affairs by thinking up new forms of more media-friendly competition. So it was that in 2003, it organized the Grand Prix de France, jointly with the CNVV. This experimental competition was based on a much simpler set of rules: all gliders start simultaneously (regatta start), fly relatively short courses, even passing back over the airfield,

and the pilots were classified according to placing, just like in Formula One racing. Even with only a restricted number of competitors, this trial made it possible to test the validity of the concept and was judged very promising by the Fédération Aéronautique Internationale. This is why FAI's Gliding Commission has decided to entrust the organization of the 1st World Sailplane Grand Prix to the FFVV and CNVV. This event, which will be held from **2nd to 11th September** 2005 , will have an extra dimension as it will bring together the world's 20 best pilots and the victor will go home with the title of **World Champion in Grand Prix Racing**. The relatively late-season date has been chosen so that this meeting does not clash with the numerous conventional championships planned for this year. To render this competition more attractive, the use of new technologies, based on GPS and the computer, will make it possible to transmit the competitors' positions to the ground and project them on a big screen so that the spectators can follow the racing in real time. In addition, a very sophisticated info-technology model will allow three-dimensional virtual images of the gliders in flight to be shown. It will be possible to see a glider from outside or from inside, against a representation of the real landscape. Transmission of video footage taken from the gliders or from an accompanying aeroplane is also envisaged, pictures which could be very spectacular with the mountain environment where the races will be set.

With the regatta starts, turn-points over the field, the tracking and high-speed arrivals, there is no doubting the spectacle that Saint Auban will offer all week. But the Federation wants to go even further by inviting all gliding enthusiasts to a European Sailplane Show over the final weekend (10 and 11 September). This event will comprise exhibits by the principal glider manufacturers, stands offering used bargains and an air show with the constructors presenting their latest products, vintage gliders in flight, the Big Wings of the Open Class flying to music, exhibition aerobatics by both sailplanes and powered craft and demonstrations by impressive scale models. In addition, the departures, turn-points over the field and arrivals of the Grand Prix will be an integral part of the programme. This veritable feast of gliding should attract large numbers of European enthusiasts to Saint-Auban's airfield.

- The 1st FAI World Sailplane Grand Prix has been integrated to the program of the FAI Centenary. The competition will be run in the 15m Racing Class but standard class gliders will also be allowed to participate.
- Each National Aero Club may enter 1 pilot and 1 reserve pilot.
- The number of entries permitted is limited to 20 for safety reasons (regatta starts). If there are more than 20 entries only the 20 best ranked in the IGC Ranking List will be accepted.
- If there are fewer than 20 entries, reserves will be accepted to make up a total of 20 pilots. The IGC Ranking List will be used to determine the order of the reserves.
- Preliminary entries must reach the Organisers by March 31, 2005 at latest.
- The tasks will be relatively short (< 2H30) and the possibility of running two tasks per day is not excluded. Turn points may be set over the airfield or on well known, easily accessible mountains. A maximum altitude for rounding these turn points may also be set to make things more spectacular.
- The starts will be simultaneous (regatta starts) across a straight line. The start procedure successfully tested at the Grand Prix de France in 2003 will be used. The Organisers will use GNSS flight path tracking equipment to give the possibility to the spectators to follow the progress of the pilots during the races. The pilots will have to agree to carry the tracking units if they are required to do so. The Norwegian Vpos tracking system will be used and the position of the gliders on a 2D map as well as virtual 3D pictures will be displayed on a screen on ground. A simple time scoring will be used for the daily scoring. Each pilot will get his time, outlanders will be getting the time of the last finisher plus a penalty calculated assuming they would have covered the missing distance at a speed of 60km/h (1 min per missing km). The overall scores will be calculated using place scoring. Points will be given to the first 8 pilots every day according to the system used in Formula 1 Car Racing. The winner will be awarded the title of World Champion in Sailplane Grand Prix Racing.

Jase Indrebo receives his ticket from Rex Mayes at Williams

A third generation Indrebo gliderpilot!

Kenny and Suzanne Price (nee Hinkle) Tie the Knot!

A Happy Day!

2005 AirSailing Cross Country Camp
(Charlie Ferguson)

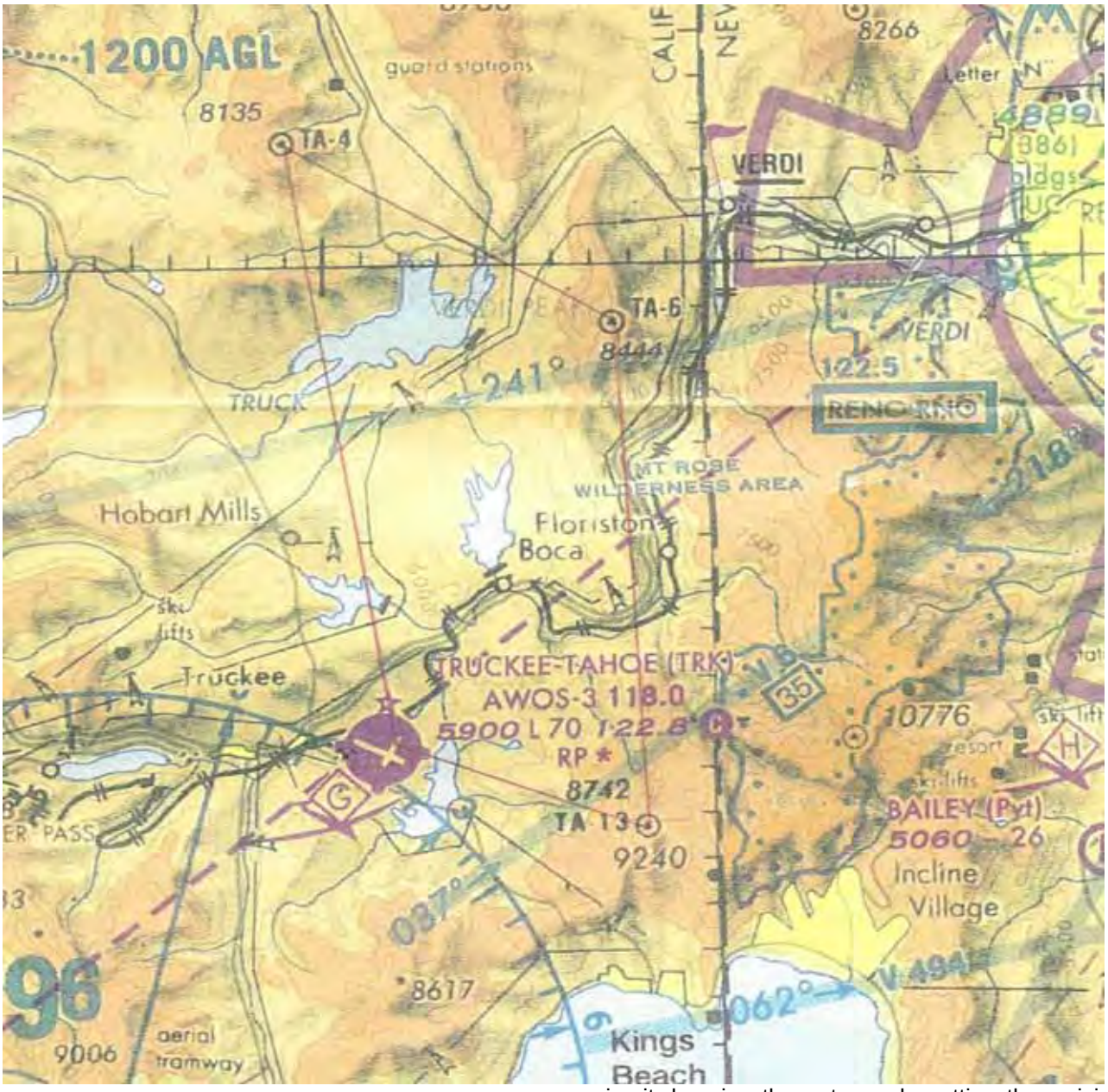
I am still not down to earth after last week's x-country camp at Air Sailing. I, as well as everyone there, had a great time expanding personal horizons in this sport. There was a lot of knowledge imparted to us neophyte x-countryer's within one week's time. One of the funnest exercises was to intentionally land out on Flanagan dry lake about 20 miles north of ASI. We had such good lift that day that four airplanes; three Schweizers and a Blanik L-13, arrived over the lake at about 13k msl just to spiral down and get a lay of the land. The first to touch down was our lead pilot Roger Harris in his 1-35. Then I followed in NSA's 1-36, then Buzz Graves in the NCSA 1-26 and finally the Blanik piloted by Dennis and Gary. The lake bed is like a flat-as-glass lizard skin. the color was so uniform that you couldn't tell your height until about 10 feet off the ground. When the tow plane arrived we all towed at a slight angle to the wind to avoid the dust. This is one of the medium sized dry lakes at about 5 miles wide by 10 miles long.

After releasing from tow near Pond Peak, I had a flight of about two hours with my lead pilot exploring the southern end of Warm Springs Valley and Pond Peak area. Most days of the camp, the wind was never over ten knots, temps were high until Thursday when thunderstorms came in and made goals challenging. I had set a silver distance goal on Friday for Silver Springs and back. I waited too long to launch and over development happened and my 2000' foot tow sent me back to the airport. So I decided to abandon the silver attempt and take a higher tow towards the Moon Rocks, which were working, and thermalled up to 12k. I then followed a cloud street west to the Peterson Ridge and burst out into the blue and sink. As I got lower, I edged towards Reno Stead and switched to their awos and unicom in anticipation of landing. Right as I was surveying the landing pattern, I ran into a good thermal and circled back up to 13.5 k. I headed north under a lip of dark clouds without circling at 100 mph in 2-4 knot lift, trying not to get sucked up into the cloud. This lasted for about 15 miles (I lost maybe 1000') and then stopped to circle in a strong thermal at the north end of the Dogskin mountains. I was back at 14,000' when I headed out toward Flanagan dry lake and Herlong. I cruised east-west in convergence lift for a couple of 10 mile laps above Flanagan dry lake in 2-4 knot lift. While doing this, I set my trim, ate my lunch, and took some pictures of Honey Lake, Smoke Creek Desert, and Pyramid Lake. I was getting cold and occasionally hitting hail, so I decided to head back to Air Sailing. There was a dark line of clouds and falling virga between me and the airport, so I waited until I saw a gap in the wall of rain, and headed for it. Rain fell on the canopy fairly heavy until I punched through the gap and then it was suddenly dry. I was glad at first until I noticed that sink was around 6-8 knots. I was a little worried for a moment as I was still about 7 or 8 miles from the airport and descending through 8.5k. But I edged toward the windward side of the Dogskins, assuming that the western, sunny side would produce more lift than the late afternoon lee side of the mountain, which it did. I made it back to the airport with plenty of altitude to check the wind conditions and set up and land on rwy 35. The total time of my flight was 3 hours and I covered about 80 miles. I think the previous days of instruction and conversations with the many knowledgeable instructors and lead pilots prepared me for this flight (as I had actually flown all these areas with the lead pilot earlier in the week).I think this is a great way to start cross country flying and I plan to go to Air sailing again next year.

T A G A R s !
(Truckee Airport Glider Air Races)
by Sergio Colacevich

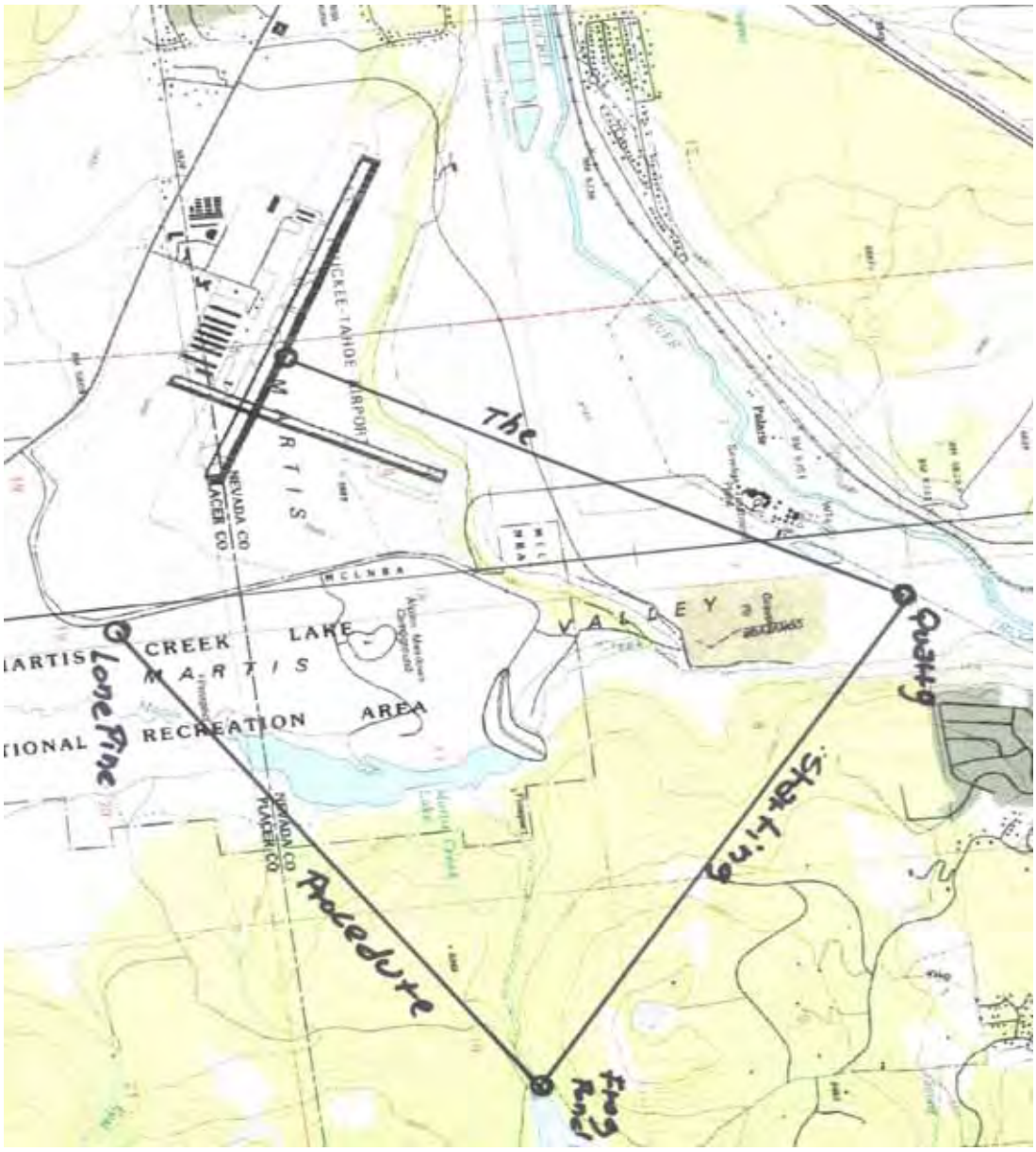
History was made on the 4th of July, this year in Truckee : the first TAGAR's! (Truckee Airport Gliding Air Races!) took place.

This event was conceived to bring spectators to the world of gliding. It is a contest where the public can actually see all the gliders start at the same time, and then watch as they pass repeatedly overhead.
The first part of the event is the Starting Procedure. It is not simple to have eight or ten or more gliders in line, all at the same altitude, and to have them start all at the same time. So the Starting was conceived as a three-leg Procedure, where the gliders enter one at the time, spaced every 20 seconds, make the first turn spaced every 15 seconds, and the second turn spaced every 8 seconds. This takes them in the final leg all in a line (following the first glider) and with 220 yards separation. The equal altitude for all gliders is attained by the first glider broadcasting its altitude every 100’ in the final leg. Everybody on the ground was looking up at the line of glider slowly proceeding parallel to the airport runway. At a radio command from the ground, all gliders turned left, and crossed the runway. Then the command to begin the races was given! Please see the graphic of the circuit. It starts from Truckee Airport , then goes to Martis Peak , Verdi Peak , the White House, and back to Truckee Airport . The circuit has to be completed three times, 42.7 miles each, for a total of 128.1 miles. It can be done in a little more than two hours. The pilots communicate to the ground when they go around each turnpoint. On a table, a board displays a big map of the circuit. Markers representing each glider were moved every time the news came that a glider had made a turnpoint. So the squadron of glider was moved around the circuit according to their respective positions. On average, a new report came every couple of minutes. Scoring is based on points, not on elapsed time. The gliders collect points at the end of each circuit.



25 points to the first glider, 20 to the second, then 16, 13, 10, 8, etc. For the third circuit, the points are

doubled, for a maximum possible at the end of the race, of 100 points. This induces the pilots to increase speed when close to the gate, consequently getting lower and more visible for the spectators! However, for safety there is a minimum height of 2,000' AGL. There were more people on the ground administering the race than pilots in the air. A couple of people were handling the radio, and another person was writing down the times of the gliders reaching the turnpoints. Other people were assisting by moving the markers on the board of the circuit, keeping the gate, and spotting the arriving gliders with binoculars. A photographer and a video camera operator also participated. Others were filling the gaps and helping when one position was temporarily vacant. The most interesting aspect of the race was an absolutely close battle between the first two gliders, 5H, a Duo Discus piloted by Mike Mayo, and L6, an ASH 26 piloted by John Fitch. 5H and L6 were far ahead of the rest of the group, with 5H leading L6 by about 5 minutes. Gradually the time difference was reduced to 1 minute, and at the last turnpoint before the gate the pilots were reportedly together. 5H turned to the left. L6 turned to the right, found 7 knots, made four turns and the race was over.



However, according to the scoring system, the points accumulated by 5H during the first two

circuits were enough to make up for the higher score of L6 for the last circuit, and the two pilots both got 90 points, for a tie! 1PS had to land after the first lap due to the glider being needed by another party. A pity really, because he was third at the end of the first circuit.

Please look at the scoreboard and the final results. Note that the two winners had the same points because of the scoring concept: It is not enough to arrive first on the last circuit, the public wants to see action at every gate crossing. After the very favorable comments of pilots and spectators, it has been decided to organize another TAGAR's event without waiting for next year. The date chosen is Monday September 5, Labor Day. It is the third day of an extended week end, when pilots have already burned their desire for a long cross country flight and are inclined not to stray too far from the airfield, so that they may leave for home early.

This event is made for the spectators. Everybody is invited to fly on the race, or follow the race from the ground. Come now while it is still free! Next year grandstands will be assembled, and tickets sold at exorbitant prices (not really no, this is a joke). According to the sentiments running in the FAI (Federation Aeronatique International) events like this are the future of the sport. The general public may not be interested in watching our traditional contests, because they cannot see the gliders most of the time.

Think about this: On the last leg of the starting procedure the gliders are all in one single file, spaced 220 yards apart. At a command from the ground, all gliders make a turn to the left and shortly thereafter receive the "Good Start" and begin racing. Pilots that were at the beginning of the line on the procedure reported how amazing it was to

see all other gliders well aligned at the same height while making the turn!

Merit goes to the helpers. Nancy Mayo was the fast and efficient keeper of the turnpoints report, Nataly Loewenstein handled the camera, Stuart Mayo handled the video camera, Miriano Ravazzolo piloted the markers around the graphic of the circuit, eagle-eyes Diana Ravazzolo was the Gate Keeper, John Volkober loaned his powerful radio, Nancy and Tony Gaechter helped by filling the organizational gaps and taking pictures, and the dynamic staff of Soar Truckee provided the incredible smoothness of operations that distinguishes this gliding site.

Merit goes to the pilots, who were disciplined and dedicated to the serious task of entertaining themselves and the public. There is a definite feeling that the second TAGAR's will be even better than the first one.

Join the Excitement!
At Silverado, we're serious about having fun, and…
The fun just got funner!

Silverado Soaring has added a DG 505 to the fleet.

This high performance 2 place glider is a great addition to our 2 Grob 103s.

- Enjoy a generous, reserved scheduling allowance.
- No hourly use charges.
- Access to club gliders for cross-country flights.
- Silverado has member flight instructors.
- Gliders based at various locations, giving variety to your flying and taking advantage of gliderports seasonal conditions.

For additional information contact our membership director:
Paul Wapensky, (650) 873-4341, WapenskyPJ@mfr.usmc.mil or
Ray Sanford, (530) 671-4800, RNCSAN4D@COMCAST.NET

Membership requirements are private pilot certificate for power or glider, checkout with an approved instructor, and initiation fee of $300. Pilots using gliders for cross-country and the DG 505 must meet certain requirements.

Contest Results U.S. 18 Meter National Championships

Siskiyou County Airport, Montague, CA
Cumulative Summary, 18 Meter Class

Rank	Points	ID	SSA#	Name	Glider
1	6366	P7	822736	Ittner, Gary	Ventus C-17.6
2	6363	0R	590223	Walters, Rick	Ventus 2C
3	5955	DLB	97756	Bush, Dale	Ventus 2A
4	5893	SZ	830496	Zimmerman, Sam	Ventus 2Cx
5	5811	CW	81809	Woods, Chris	Ventus 2Cx
6	5701	2T	860414	Deane, Peter	LS-8a
7	5590	F8	928979	Gawthrop, Bill	ASH-26E
8	5586	RV	901957	VanGrunsven, Dick	Ventus 2CM
9	5501	5S	642088	Salkeld, Ed	ASH-26E
10	5331	VK	913956	Kozlik, Wiktor	LS-8T-18
11	5246	JJ	680958	Sinclair, John	Genesis 2
12	5221	89	732001	Indrebo, Rick	ASW-27B
13	5164	SD	871470	Pfiffner, Richard	Ventus B-16.6
14	4944	7V	266582	Gimmey, Ray	ASW-27B
15	4790	98	115576	Alexander, Pete	ASW-27B
16	4604	16	904268	Greenhill, David	Discus 2A
17	4233	CM	150983	Crosina, Mario	Ventus 2ax
18	4199	11L	551732	Oldershaw, Paul	Ventus B-16.6
19	2146	NF	673293	Smith, Stephen	LS-6-18W
20	1574	IY	203688	Ekdahl, Carl	ASW-27
21	1119	RM	15630	Frantz, Cole	Discus CS
22	48	711	189227	Kelley, Tom	ASW-27B

Thanks to Gary and Nancy Kemp for contest management, scoring, Charlie Minner as CD, Dick Piffner for weather, all the line crew and tow pilots for a great job!

The score sheet shows how tricky the conditions were; conditions for the first half of the contest were VERY hot, low and blue with large amounts of low altitude ridge running and rockscraping; tiring work. Several excellent pilots missed important thermals and had unexpected landouts. When we got some moisture pulsing in to the area we had some spectacular conditions with 90mph speeds and course out to the east, though we never got to go to Crater Lake, the “big cahuna” of Montague tasks. More detailed report in a future issue.

The winner of the National 18m.National Championship was Gary Ittner by a slim margin of only 3 points over Rick Walters. Both Rick and Gary flew a consistent and smart contest mastering the tricky conditions we faced here throughout the contest and throughout the task area on a daily basis. They both showed the ability to shift gears when necessary and put the pedal to the metal when appropriate. They will both be great representatives on our team at the World Championships in Sweden.

In the Motor glider Championship within the 18m. contest, the race was equally as close with Bill Gawthrop taking the Championship over Dick VanGrunsven by a mere 4 points. Ed Salkeld took third place only another 85 points behind Dick.

Cole Franz; our lady pilot visitor from the East Coast flying her Discus

105 degrees F on the flightline….

"Getting Around The Coriolis Force"

David J. Van Domelen, The Ohio State University, Department of Physics, Physics Education Research Group

Abstract

The Coriolis "force": most people know about it, but few understand it. A simple explanation not requiring an intuitive understanding of angular momentum is provided. Scales over which the Coriolis Effect is relevant are also discussed.

Introduction and Motivation

At some point in their lives, most people hear about the Coriolis force, whether in reference to weather patterns, sea currents or, most prosaically, which way water flows down the sink. Unfortunately, while many have heard of it, few understand it well enough to explain it without resorting to vector equations.

Of course, most physics textbooks which deal with angular kinematics will have the following equation relating the Coriolis force to an object's mass (m), its velocity in a rotating frame (vr) and the angular velocity of the rotating frame of reference (w): **FCoriolis = -2 m (w x vr)** The text will then either explain the Coriolis force in terms of angular quantities such as conservation of angular momentum, or will use the Coriolis force to illustrate the angular kinematics. **Unfortunately, most of us are not comfortable with angular mechanics**. It would not be an exaggeration to say that some people dread it. Nor can we expect students to enter the classroom understanding the Coriolis force. Hence, whether using physics to explain the phenomenon or using the phenomenon to explain the physics, students are shaky on both sides of this relationship.

So, what to do? This article intends to develop a means of explaining the Coriolis effect to people who haven't yet grasped angular mechanics. The explanation relies on linear quantities and uses rotational concepts infrequently.

The Basic Premises

The following principles are needed before starting the body of the explanation: Newton's First Law in component form - Objects in motion stay in motion unless acted on by an unbalanced force. A vector component of velocity will not be changed by a force perpendicular to that component.

Spherical Geometry of the Earth - X degrees of longitude gives you different distances between longitude lines (in miles or kilometers) at different latitudes, plus a few additional results of being on a sphere which will be detailed later.

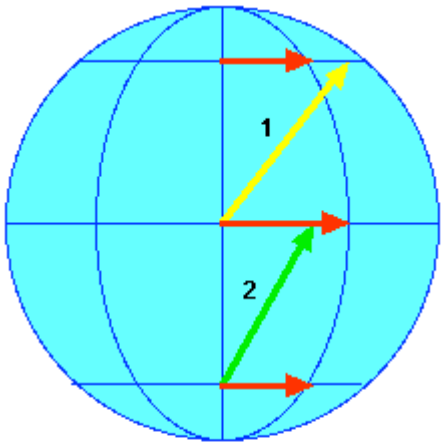


Figure 1: Apparent deflection of objects on northerly trajectories. Red arrows represent the motion of objects fixed to the surface of a turning globe. Yellow and green arrows are objects not fixed to the globe and given an northerly velocity. The yellow arrow arrives ahead of a fixed object, the green arrow arrives behind. The yellow arrow shows the deflection to the right in the northern hemisphere, the green shows deflection to the left in the southern hemisphere.

Gravity - Objects under the influence of Earth's gravity will fall towards (and thus orbit) the center of mass of the Earth.

Force - In one way of looking at it, a force is anything that causes a mass to accelerate in one's frame of reference. However, most people think of force as "something doing something to something". The Coriolis effect is a force in the first sense, but not in the second sense: nothing is actually pushing or pulling on anything, the acceleration is due to the fact that the observer is moving in a circle. From this point on, the Coriolis effect will not be directly called a force, even though that's how it's normally characterized.

Premise 2 is probably the easiest for students to accept, since you can draw on a globe to demonstrate that an inch is 15 degrees of longitude at one latitude and 30 degrees at another. Having a ball or globe on hand for the explanation is generally helpful. Premises 1 and 3 require some science background, however, but should be acceptable to students in mechanics courses.

Explanation of the Coriolis Effect

While all Coriolis-based deflection can be explained using rotational concepts, a linear explanation is simpler if you separate the effects

into those in the north/south direction and those in the east/west direction. The deflection of objects moving north and south can be explained without invoking centripetal acceleration, as we see next.

I Feel The Earth Move Under My Feet: North/South Motion

Note first that all points on the Earth have the same rotational velocity, w (they go around once per day). Also, places at different latitudes have different linear speeds. A point near the equator may go around a thousand miles in an hour, while one near the North Pole could be moving only a few dozen miles in an hour.

Normally, objects in contact with the ground travel the same speed as the ground they stand on. As a result, the Coriolis effect generally doesn't have a noticeable effect to people on the ground; the speed of the point you're standing on and the speed of the point you're stepping onto are too close for you to tell the difference. Or, looking back at the Coriolis effect equation above, if the velocity relative to the rotating frame (the Earth) is zero, so is the Coriolis effect.

However, when an object moves north or south and is not firmly connected to the ground (air, artillery fire, etc), then it maintains its initial eastward speed as it moves. This is just an application of Newton's First Law. An object moving east continues going east at that speed (both direction and magnitude remain the same) until something exerts a force on it to change its velocity. Objects launched to the north from the equator retain the eastward component of velocity of other objects sitting at the equator. But if they travel far enough away from the equator, they will no longer be going east at the same speed as the ground beneath them.

The result is that an object traveling away from the equator will eventually be heading east faster than the ground below it and will seem to be moved east by some mysterious "force". Objects traveling towards the equator will eventually be going more slowly than the ground beneath them and will seem to be forced west. In reality there is no actual force involved; the ground is simply moving at a different speed than its original "home ground" speed, which the object retains.

Consider Figure 1. Yellow arrow 1 represents an object sent north from the equator. By the time it reaches the labeled northern latitude, it has traveled farther east than a similar point on the ground at that latitude has, since it kept the eastward speed it had when it left the equator. Similarly, green arrow 2 started south of the equator at a slower eastward speed, and doesn't go as far east as the ground at the equator...seeming to deflect west from the point of view of the ground.

Well, It Used To Be East: East/West Motion

In explaining how the Coriolis effect acts on objects moving to the east or west, it helps to turn off gravity for a moment. Don't worry, we'll turn it back on later, just be sure to put the lid back on your coffee.

Consider being on a rotating sphere with no gravity. An observer who is glued to the sphere throws a ball straight to the "east" on the globe, in the direction of rotation. Since there are no forces on the ball, it will travel in a straight line, the tangent line shown in Figure 2 at t=0

.

Time passes, and the ball continues on its straight line. But the observer is attached to the globe and moves around to a new position. At this new position, the observer's definition of the "east" direction has changed, and is no longer the same as it was at time t=0. The ball is no longer traveling on the observer's "east" line, and, in fact, seems to have drifted off to one side. If the globe is spinning slowly enough that the observer can't feel the spin, then the natural conclusion would be that some mysterious force pushed the ball off course, sending it drifting away from the axis of rotation more quickly than it would go if it were still heading the "correct" easterly direction.

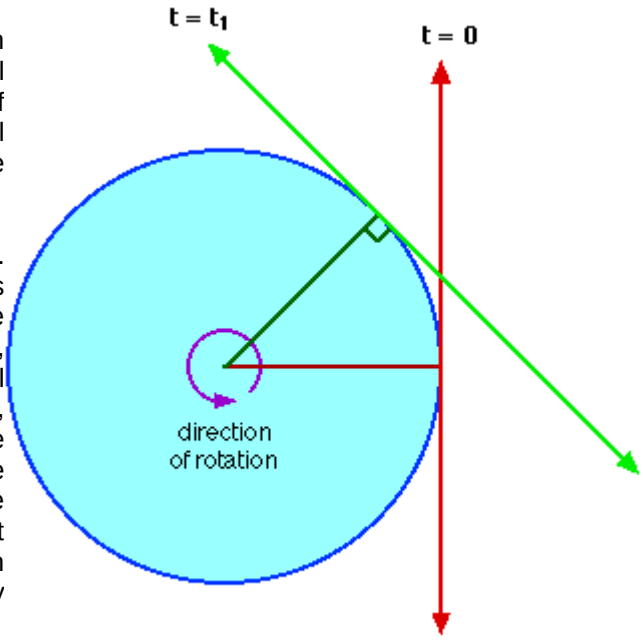


Figure 2: Change in the direction of "East" in a rotating system.

Similarly, if the observer throws a ball to the west at time

t=0, it will seem to have been forced inward towards the axis of rotation because the "west" line has moved

Now to turn gravity back on. Gravity pulls objects towards the center of mass of the Earth, which means it cannot change an object's velocity in the directions perpendicular to up and down. In other words, it won't change the east/west or north/south components of an object's velocity.

Figure 3 shows a slice through the Earth so that east points out of the page. The thick arrows show the directions that eastbound and westbound projectiles would seem to go as a result of the Coriolis effect in the absence of gravity. The eastbound projectile (red, upper horizontal arrow) would seem to drift away from the axis, while the westbound projectile (green, lower horizontal arrow) would seem to drift towards the axis. Both of these lines have been split into components, with one component being "up/down" and the other being "north/south." Gravity will act against any "up" components, and the presence of the ground will act against any "down" components, so projectiles will stay within the light blue "atmosphere."

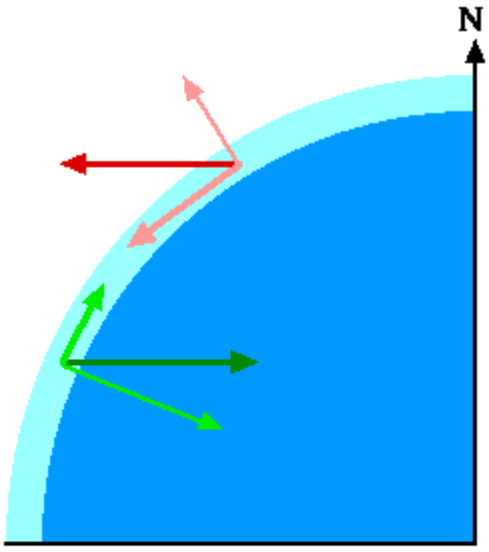


Figure 3: Coriolis deflection broken into radial and tangential (North/South) components. The view is of a cross-section of the Earth. The bold arrows are the actual deflection (red for eastbound, green for westbound), and the pale arrows are the radial and tangential components.

As a result of gravity pulling down on objects and the ground holding them up, the remaining effect of the Coriolis effect on objects heading east or west is to deflect them to the north or south. In the northern hemisphere, objects heading east are deflected to the south, for example. The Coriolis effect "pushes" them away from the axis, and gravity pulls the object back down to the ground so that the remaining effect is an apparent "push" to the south.

It's worth noting that this effect is weakest at the equator, since there's no north/south components to "great circle" motion moving east or west along the equator. And, of course, it's also weakest at the poles, since there's no meaningful east or west motion. It turns out that this effect is strongest at mid-latitudes.

Putting It Together: Low Pressure Systems

Now we've explained how things moving towards the poles curve to the east, things moving away from the poles curve to the west, things moving east curve towards the equator and things moving west curve towards the poles. In other words, air (or anything else) moving freely in the northern hemisphere deflect to the right, air moving freely in the southern hemisphere deflect to the left. And this is what the result of the vector cross products in the Coriolis effect equation says as well, in its mathematical shorthand

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What does this mean for, say, weather systems? Take, for example, a low pressure center, where there's less air than in the area around it. If there's less air in one place than in the surroundings, air will try to move in to balance things out.

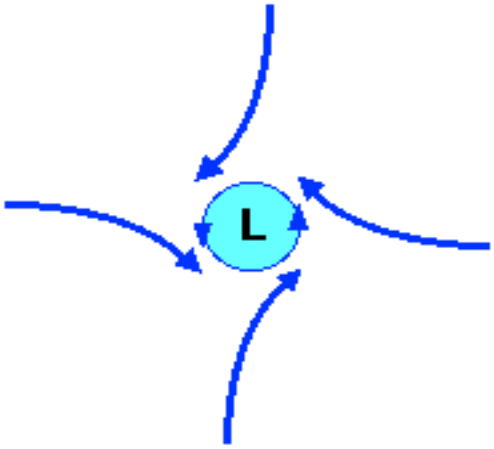

Figure 4: Vortex created in a low-pressure system.

Air starting at rest with respect to the ground will move towards a low pressure center. Such motion in the Northern Hemisphere will deflect to its right, as shown in Figure 4. However, the forces which got the air moving towards the low pressure center in the first place are still around, and the result will be a vortex of air spinning counter-clockwise. Air will try to turn to the right, the low pressure system will try to draw the air into itself, and the result is that air is held into a circle that actually turns to the left. Without the Coriolis effect, fluid rushing in towards a point could still form a vortex, but the direction would either be random or depend solely on the initial conditions of the fluid.

The eye of a hurricane is a clear example of fast winds bent into a tight circle, moving so fast that they can't be "pulled in" to the center. The very low pressure at the center of the hurricane means that there is a strong force pulling air towards the center, but the high speed of the wind invokes the Coriolis effect strongly enough that the

forces reach a kind of balance. The net force on air at the eye wall is a centripetal force large enough to keep the air out at a given radius determined by its speed.

Other Results and Non-Results

"Fine," you may say, "that explains storms. But what about water going down the sink?" In fact, this question is a good "hook" for getting students interested in the Coriolis effect in the first place.

Because the Earth's angular velocity is so small (360 degrees per day, or about 7 x 10-5 radians per second), the Coriolis effect isn't really significant over small distances (As equation 1 shows, high velocity also can make a difference, but for the purposes of this paper small distance-high speed effects will not be considered). So, what things are likely to be affected by the Coriolis effect in a large way?

Up In The Air

Just looking at a weather system on the nightly news gives one example that has already been addressed. Large weather systems feature masses of air and moisture that travel hundreds of miles and can have wind speeds reaching over a hundred miles an hour in the worst storms.

Another example of a quickly moving object in the sky which covers hundreds of miles is an airplane. All pilots need to have familiarity with the effects of the Coriolis effect, since airplanes can reach speeds much higher than even the fastest hurricane winds. Over the course of a several hour trip, an airplane could be deflected by a significant amount if the pilot didn't compensate for the Coriolis effect.

Long-distance artillery may or may not be another example of something requiring a Coriolis correction. I've seen some papers that say it's negligible compared to the Magnus force (a result of the fact artillery shells spin), and others that claim it is important on its own.

So, fast things moving over great distances can be significantly affected by the Coriolis effect. But what about the sink?

Water Going The Wrong Way Down The Sink

In a kitchen sink, of course, speeds and time scales are much smaller than hours and miles. Water rushing down a drain flows at speeds on the order of a meter per second in most sinks, which are themselves less than a meter wide. Qualitatively, there doesn't seem to be much chance for deflection. Quantitatively, putting these numbers into Equation 1 results in an estimated change in rotation of only a fraction of a degree per second, and a very small fraction at that...less than an arc-second (1/3600th of a degree) per second over the course of the entire draining of the sink, ignoring additional effects caused by conservation of angular momentum and the like. Under extremely controlled conditions, this can cause water to flow out of a container counter-clockwise in the northern hemisphere and clockwise in the southern hemisphere, but your kitchen sink is not so controlled. Things like leftover spin from filling the sink (even when the water looks still, it's rotating slowly for a long time after it seems to stop), irregularities in the construction of the basin, convection currents if the water is warmer or colder than the basin, and so forth, can affect the direction water goes down the sink. Any one of these factors is usually more than enough to overwhelm the small contribution of the Coriolis effect in your kitchen sink or bathtub. Research in the 1960s showed that if you do carefully eliminate these factors, the Coriolis effect can be observed1,2.

Water in the sink doesn't go far enough to trigger a noticeable north/south deflection. Most often, it simply spirals down the sink the way it went into the sink, and the same is true of things like the famous "demonstration" of the Coriolis effect shown at tourist traps along the Equator (especially since east/west deflection is absent!). Maybe there's a conspiracy to manufacture right-handed sinks in the Northern Hemisphere and left-handed sinks in the Southern Hemisphere? In any case, don't blame it on the Coriolis effect unless your sink is the size of a small ocean.

Acknowledgements

Thanks to the readers of the Usenet newsgroups alt.fan.cecil-adams and misc.education.science for asking the questions which inspired the author to devise an explanation for the Coriolis effect. Thanks also to Donald Shabkie, who pointed out the importance of the Coriolis effect to aviators after seeing the above explanation online, and to Steven Carson, who pointed out the references in Nature. Finally, work on this paper was supported in part by NSF grants NSF GER-9553460 and NSF DUE-9396205.

Use of Mode C Transponders

Reno, Nevada

The potential conflict between gliders and commercial air traffic near Reno has increased with the growth of commercial jet traffic into Reno-Tahoe Airport (RNO) during the past few years. PASCO emphasizes that glider pilots operating in the Reno area must be alert for all air traffic arriving and departing RNO.

Transponder signals are received by Traffic Collision Avoidance Systems (TCAS) on board commercial aircraft as well as by Air Traffic Control (ATC) Radar. By Air Traffic Control (ATC) Letter of Agreement, gliders in the Reno area can transmit the 0440 transponder code in the blind, without establishing radio contact with Reno Approach Control.

PASCO recommends that gliders operating cross country, within 50 NM of Reno-Tahoe Airport, install and use a Mode C altitude encoding transponder.

A new page has been added to the Minden Soaring Club Web site: http/www.mindensoaringclub.org/. Look under the WELCOME page for a new section for those soaring out of Truckee, Minden, or Air Sailing. Please study this material on safe soaring within the Reno ATC area.

Minden Airport Update (Leo Montejo)

I am attaching a copy of the MAA newsletter to all of you in order to make sure that everybody is up to date with the ongoings at the airport. Read carefully. I believe all of us, united as a group, have made some progress. The situation is complex, and a perfect outcome is thus difficult to define.

Nevertheless, it looks as if we will have Rwy 21 open again in the near future, therefore making wave day landings, or even late afternoon landings when one returns from the Whites much safer.

Bob Semans has been working hard to ensure that all East Side development conforms to the requirements of an international soaring contest. Louis Scheel has indefatigably attended most if not all of the countless meetings. There is much left to be ironed out. That is when the real work will begin. I believe we are at a turning point here, and the soaring outlook is now better at Minden than it has been for the last few years.

Minden Airport Association is one year old this month!

It's been a busy year with much accomplished and more (okay, a lot more) still to do. We've put the airport rules behind us, as well as the updated T-hangar lease agreement ("AKA" fire rules). You'll recall these two issues were the catalysts in the formation of MAA. Achieving compromise and resolution on this was accomplished using work groups with county and airport management, two county commissioners, airport advisor committee members, and county counsel. Particular credit goes to Commissioners Jim Baushke (a pilot) and Doug Johnson who attended all our meetings.

On gliders, Eastside development, cross-wind runway 21, safety, and more:

During the aforementioned workgroup meetings, when we had time, we broached the subject of gliders, down some 20 – 30% over the past few years (according to Tony Sabino, owner of "Soar Minden"). We explained that there's a widely held perception that MEV has become more glider and business unfriendly over time, and that this needed to be addressed and reversed. Dan Holler (county manager) assured us that soaring was both appreciated and welcome at MEV and that there was no effort or pressure from any entity to "get rid of soaring". Much more was discussed; however, this remains an open issue, which will take time to resolve.

The idea of operating gliders from the Eastside of the airport was born long before my involvement at Minden. It is addressed in the old '93 Airport Master Plan as being essential for safety, to reduce the number of vehicle runway crossings, and for the physical separation of glider and power traffic. As such, this remains a prime FAA safety objective. Years ago, through the efforts of Bob Semans, Steve Eddy, Rich Walters, Lind Mae Draper and others, draft plans were drawn up for a glider-friendly Eastside development.

Last year airport manager, Jim Braswell, announced at a "brown bag" meeting that the Eastside plans were on display at the airport office and invited comments, suggestions and input. From these plans, we noted that the closed runway 21 taxiway was being proposed for a cross-wind runway instead of closed runway itself. When we questioned this, explaining that using the existing runway 21 would be far more cost effective, better accommodate big wing gliders with even a narrow overlay, involve less of a ground handling and safety issue in very strong Southwesterly winds (less distance for crosswind taxiing to get to tie-towns), and would allow more efficient space utilization, we were told that the FAA would not fund a runway that terminated in an intersection (Rwy 12-30 & Rwy 16-34). At the time, this raised some doubts, as we knew of many airports with multiple intersecting runways/taxiways. Linda Mae, MEV's AOPA volunteer and safety officer, was particularly adamant that we should be using the old runway 21 - - and soon!

Thus, some 8 months back, Linda Mae and Terry LaLonde started hosting Eastside planning meetings with representatives from MAA, Minden Soaring Club, Soar Minden, and a diverse group of others who helped during the process. All this with the goal of modifying and fine tuning the plans to allow for smooth glider operations, safety, and a friendly, synergistic and welcoming atmosphere that would attract gliders back to Minden.

Besides reopening runway 21, some plan details include resurfacing of the dirt runway 30G with turf (either real, or as suggested by Jim Braswell, maybe synthetic) or pavement, glider tie-down ramp, a large RV parking and camping area, viewing stand and grass, area for MSC clubhouse, FBO's, hangars, perhaps an "assembled glider" storage facility, pad for winch launching and more.

From all of this, including Commissioner Baushke's suggestion that it would be good for the various airport groups to come together to agree on as much as possible, we concluded the best approach would be to form a "Combined Planning Group". Now, I suspect Jim Baushke may have had several things in mind when he made that suggestion. Getting the groups to agree on shared interests would make it that much easier for government to deal with us! Not sure, but he may also have figured that since neither local government, nor the FAA, can promote a ballot initiative, such a group might provide a vehicle to help deal with the pending MEV weight ordinance problem.

MAA took this as an opportunity to cover some more ground for our members. We (the CPG) had to update and iron out a rough draft proposal for Eastside development, utilizing all the work and input that had come before, and then "sell that" to the county and FAA. In exchange for their acceptance and help, we offer our help with the weight ordinance (more on this in a bit).The Combined Planning Group, made up of board members from MAA, CVVC, and MSC held numerous meetings to hammer out the primary aspects of the Eastside plan as well as our vision for the direction the airport should take to address planned growth, the needs of the users, airport business and the desires of the community. The resultant plan is intended to be flexible, with much detail left to be decided. CPG agreed that we needed to finish the draft plan *before* the "Airport Visioning" study by outside consultants was started. This was to insure that the needs of the majority of users would receive due consideration through the visioning process - - and not be swept aside or diminished through pressure from "other interests".

Once the draft plan, MEV impact document, preamble, planning group's agreed statement, phased development and priorities package were finished, we set up meetings with the county commissioners (except for Kelly Kite, who we have yet to meet with) and the county manager to introduce the plan. This went well, with interest and tacit approval from all. At this point, the meeting with the FAA, just two days ago as I write this, was still pending. Unanswered was the pivotal question of whether they could support this plan with AIP funding. The meeting with Andy Richards, manager, FAA airport district office, could hardly have gone better, and was also attended by Louis Scheel (MSC), Terry L. and I (MAA), Jon Hannon (CVVC), Jim Braswell and Keith Kallman (MEV).

Yesterday we spent two hours with Patrick Gallagher, State of Nevada Aviation Coordinator (NDOT). It is safe to say that the meeting went equally as well as our meeting with the FAA. Pat is on board to help effectuate our plan.

We've done articles on the MEV weight ordinance before, so this will be an update. The FAA currently does not recognize the Douglas County weight ordinance as being valid. This is because it is not in compliance with FAA grant assurances, in that it sets a weight limit that is less than the load bearing capacity of our runways or ramp apron (whichever is the lesser mount). As long as there are no formal complaints of discrimination against a class of aircraft AND there has been direct financial damage as a result, then this issue remains below FAA's radar. If a complaint were substantiated, then we could lose the FAA's Airport Improvement Program (AIP) funding, and maybe worse, we could be forced to refund all monies received during the last 20 years or so as well! In case you're unaware, the AIP money comes from airline ticket sales and fuel sales. It is dolled out to airports based on demonstrated need, request, availability, and probably stuff I don't understand. For a given project, the AIP fund pays about 95% and the airport has to come up with 5%. But of course, there are some strings attached. Except for a separated $150K per year in another program, the AIP can only be used for "non-revenue" enhancing projects, such as ramp and runway maintenance, renewal and expansion, land acquisition to protect the airport etc. It cannot be used for building hangars as this is revenue enhancing - - you get the idea.

If we were to lose AIP funding, it would be nothing less than catastrophic for MEV. The airport would instantly change from a self-supporting county asset, to a huge liability. Gone, too, would be the protection and guarantees that are attached to AIP funds. For every time the county accepts this money, it renews a 20 year timer. The county must guarantee to the FAA that they will continue to use the airport for aviation purposes and further, that they will not discriminate against any class of aviation. Lets see now . . . no more FAA money, a huge aintenance burden, and gone are the requirements that the county continue to operate the airport . . . you can see where this could go. You may also see why it may be in our own best interest to be sure that a ballot initiative to change the current weight ordinance is written in such a way that it is fair, enforceable, protects our airport from damage by overweight aircraft, and complies with FAA requirements. Oh, and that it is approved by the electorate.

Getting this passed will require a lot of work, letters to the editor, local TV, posters, meeting with community groups, a good Power Point presentation - - a full fledged campaign. (No, don't start now. We'll tell you when!)

Remember MAA dues are due in January so start saving up your $15 for single or $20 for family.

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