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R/C Radio controlled SOARING DIGEST

THE JOURNAL FOR R/C SOARING ENTHUSIASTS

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R/C Soaring Digest (RCSD) is a reader-written monthly publication for the R/C sailplane enthusiast and has been published since January, 1984. It is dedicated to sharing technical and educational information. All material contributed must be exclusive and original and not infringe upon the copyrights of others. It is the policy of *RCSD* to provide accurate information. Please let us know of any error that significantly affects the meaning of a story. Because we encourage new ideas, the content of all articles, model designs, press & news releases, etc., are the opinion of the author and may not necessarily reflect those of *RCSD*. We encourage anyone who wishes to obtain additional information to contact the author. *RCSD* was founded by Jim Gray, lecturer and technical consultant.

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The Soaring Site

Web Site Links

We've noted that many things need to be updated on the *RCSD* web pages, such as our new mailing address on the .PDF files, etc. Hopefully, this hasn't created a problem for any of you. And, if it has, please send me an e-mail and I'll look into fixing or updating the most important 'irritations' first!

I had an occasion recently to link into our club and contact page and noted that several of the club links are no longer working. (At least, they weren't working properly for me.) For any of you that have attempted to access a club web site from our pages, and encountered problems, please let us know, particularly if you have identified what the new address should be.

One of the things that prompted this request was a recent e-mail from John Brown who asked:

"Please consider adding our web site, Southern California Soaring Clubs (www.sc-2.org), to your list of organizations dedicated to promoting R/C soaring. Our organization is a group of ten large clubs in Southern California that host soaring competitions and promote soaring."

Thanks,
(signed) John Brown
webmaster@sc-2.org
www.sc-2.org

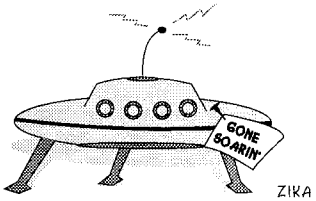
And, of course, the link is now on-line! And, it works!

Happy Flying!
Judy Slates

THE SLOPER'S RESOURCE

Our new column called "The Sloper's Resource" is authored by Greg Smith, shown here circa 1982, at Coyote Hills Regional Park in the Bay Area with a Rich Spicer Super Nova. (Pre RnR days!) It took almost 20 years for Greg to get back into soaring after the great days with that Nova!

Photography by Allen Smith.



Jer's Workbench

Jerry Slates
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Santa Rosa, CA 95407
RCSDigest@aol.com

Search & Rescue

As most of you know, the U.S. Coast Guard performs Marine Safety Inspections and Search & Rescue operations. Recently, "Search & Rescue" by the U.S. Coast Guard has taken on a new meaning.

This past winter, several of the folks in the DownEast Soaring Club did a little slope flying off an ocean bluff at Bailey's Island in Maine. The air temperature was a balmy 43 degrees; the water temperature was somewhere around 37 degrees. In fact, it was cold enough to freeze and snap the cloroplast fin off of Steve Savoie's DAW Mustang! And, who wants to attempt any kind of field repair in this weather!

So, Steve borrowed an Avero from a long time friend, Tim Acord, and stepped up to the edge of the 40 foot bluff, near the water's edge.

As the Avero took to the air, it was obvious that something was wrong! There was no control! There was absolutely no control of any kind using the sticks!

And, the Avero? It was headed out to sea...

Fortunately, it landed in about 5 feet of water. Unfortunately, that water was extremely cold. After quickly considering his options, Steve made a mad dash into the freezing waters of the North Atlantic, in an effort to catch the plane before it was caught in the swirl of outgoing tide!

For Steve Savoie, Chief Warrant Officer, U.S.C.G., Retired, it was no Walk of Shame for landing out. It was a Search & Rescue mission, clear and simple, to save a borrowed Avero, belonging to a long time friend and member of the DownEast Soaring Club!

Good rescue, Steve! Isn't it nice to be retired?

■

Steve Savoie waded in to retrieve the EPP Avero. Isn't it great when your fellow slopers just happen to have a camera in hand?

...and then the tree fired back!

by Les Grammer
N.W.S.S.

In the past, I have posted stories to the *RCSE* exchange, usually about topics dealing with safety of some sort, but sometimes just whatever whimsy crossed my mind. It has been a while, but when the mood hits, what else is there to do? I'll keep this short. (Yea, sure!)

It's always interesting to see new planes coming out at the start of the season, flyers stepping up both their skills and their equipment. You can just feel the nervousness of many of them as they launch their new found fancies into the air for the first flights under competition.

Now imagine the feeling of risking it all running down a distant thermal, finding that elusive lift at the last possible moment, and skillfully riding it to a height which easily ensures you'll make it back, with a max time to boot. You know how good it feels when you've pushed your limits, and now have the flight 'in the bag'.

That's what happened to Frank with his new Psyko, which had yet to see competition. (We won't go into the events at Phoenix.) Setting aside his nerves and uncertainty of the plane's abilities, he ran for the distant lift, and after having passed 'the point of no return" was able to locate and skillfully maneuver his plane into the core of a thermal. With each rising circle, he became calmer and more assured, then relaxed once it became obvious his flight would be successful.

The return flight to the lines was through a large area of sink, but the plane was more than capable of transitioning that distance without concern. His return would simply pass in front of the trees lining the field, and he would..... *wait*..... which side of the trees is his plane on?

Frank was sure there was no problem, and proclaimed so right up to the point where the plane disappeared behind the trees. In what I'm sure was pretty much an involuntary reflex, Frank held in up elevator and, suddenly, the plane re-appeared above the tree line, and he let out a big sigh. That's when he saw the shadow of the plane cross the top leaves, and the model clear the top branch.... almost. A small section seemed to reach right out and grab the tail feathers, halting the plane in mid flight, and dropping it into the uppermost reaches of the tree.

Now, this isn't just any tree. It's a Poplar. You know... one of those skinny (but *tall*) windbreak trees, and the plane was in the top branches... out of reach of any pole, and well beyond the height of anyone's ability to throw anything up and over.

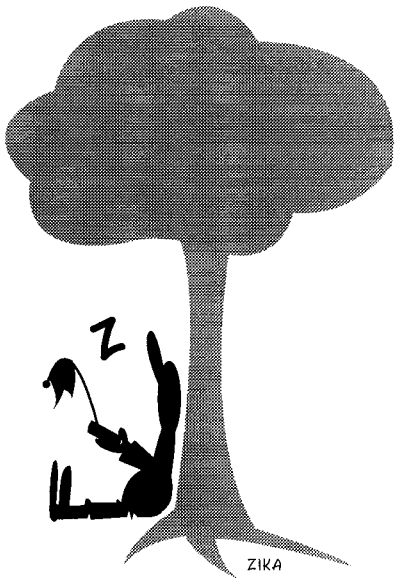
Of course, there's always one guy in the group who thinks he can shinny up a tree. (Someone *always* volunteers to scale a tree for a hung glider!) However, as the climber reached about 1/2 way up, the branches were weak at best, and started breaking away under his weight. Wanting to avoid a bigger tragedy, the climber abandoned the effort, and the rescue crew regrouped. It was finally decided to just let mother nature handle it (The winds were anticipated to be about 20 mph overnight.), and let the night winds knock the glider down.

Next morning, I joined the rescue group and we went looking for the plane, only to find it was still in the tree. Though the winds were blowing strongly, the plane was securely anchored, and it even seemed higher up than on the previous day!

The group had anticipated this possibility, and came prepared with some winch line, poly rope, and a compound bow with arrows. The idea? Shoot an arrow with winch line attached over the tree (and plane), then tie on the poly rope and pull it up and over with the winch line. Once the rope was pulled over and both ends secure, use the rope to pull over the branches and (hopefully) cause the plane to fall.

Sounds like a good idea, right? I'll bet you've never tried this before though. What types of things can go wrong?

The first problem was not anticipated. You would think that shooting an arrow over a tree, with line in tow, is akin to hitting the broad side of a barn door, but let me tell you it's much



easier said than done, particularly on a windy day. First, there's brush under the tree, not grass, and since you have to lay out enough slack line for the arrow to freely fly, the problem is preventing the line from snagging in the brush and halting the arrow. Looping the line back and forth in an "s" pattern and having bodies to 'lightly' hold the line off the ground (lifted with the backs of our hands) solved this problem. We could provide the shooter with a free 'spooling' of the line.

Next came the trajectory. The wind was blowing at 90 degrees to the best direction of approach, thus it took 5 shots before our 'marksman' could figure out an angle to even hit the tree. The wind blowing the line dramatically altered the shots. However, after about 6 shots the proper angle was being used.

Next there was the problem of the shot which looped the tree, but didn't have enough energy to drop the arrow down low enough on the other side so we could grab an end. Not a big deal, just pull the line down and try again, right?

Well, maybe! As we were pulling the line back through the tree, the arrow became wedged between the forks in a branch. The arrow was now securely stuck, with our line, in the tree. What do you do?

Well, take my advice if you ever find

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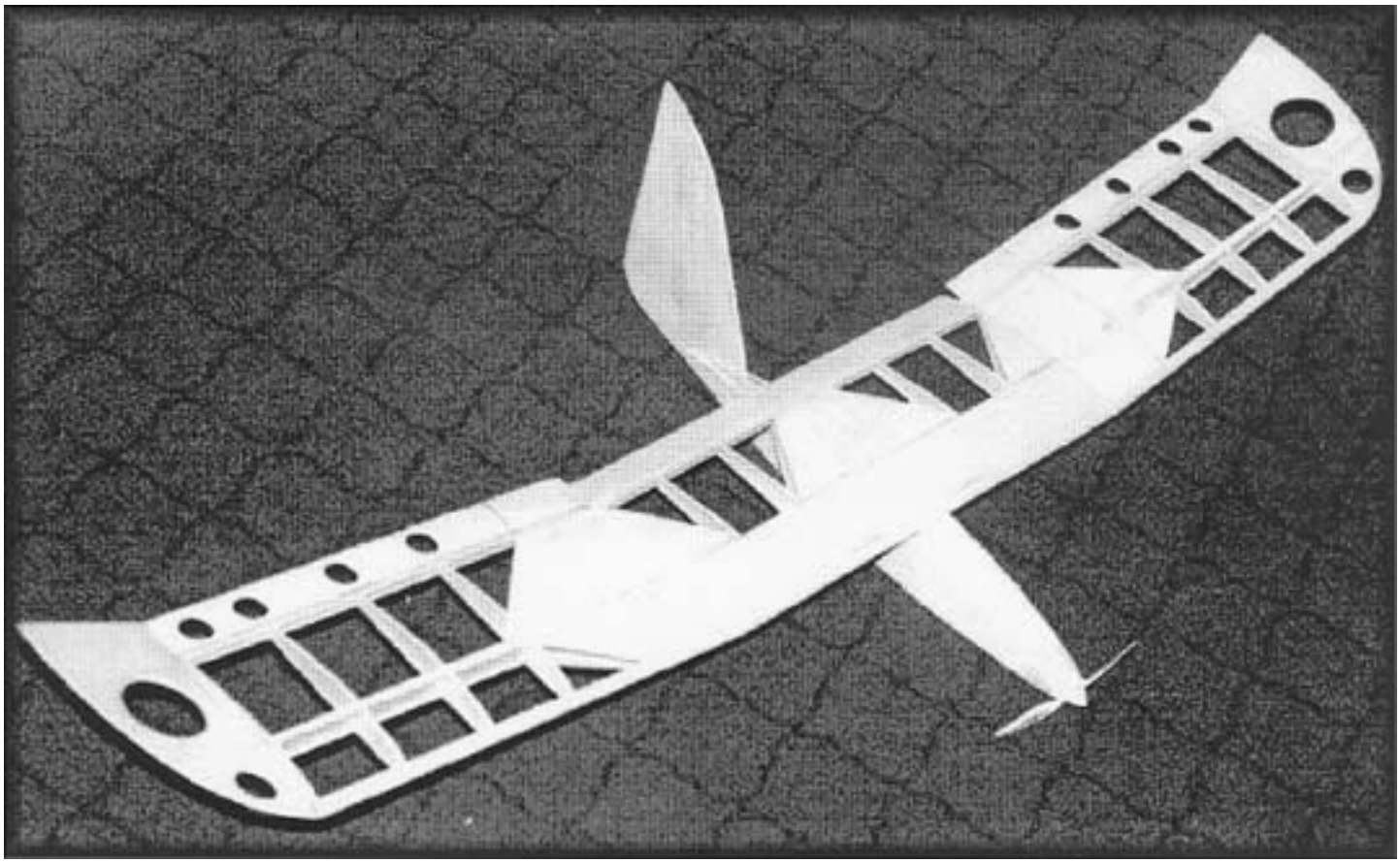

on the Wing

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http://www.b2streamlines.com

John Digby's *Sushi* RE

Proof that fundamental theory, a well considered design process and results oriented experimentation can lead to success.

John contacted us several years ago with a question related to tow hook positioning on a plank planform. Some time later we received a message from him explaining that what was originally to be a tailless RC-HLG had turned into an electric powered tailless sailplane. The resulting airplane, the Sushi RE, appeared in the February 2000 issue of *Electric Flight International*, and full size plans are available through Traplet Publications. John has two other designs in the Traplet stable as well - the Sushi 400 and the Mini-Sushi.

Here's what John had to say about Sushi RE:

Basic idea

Sushi RE is the latest in a line of electric powered plank type tailless models I have designed around the Speed 400 type motor.

Prior to the RE all have been low AR wings utilizing Alfons Rieger sections and elevon control. I was very pleased with the way these models performed, as although not designed with soaring performance in mind I was pleasantly surprised by their flat glide and ability to use available lift. Spurred on by their success I decided to build a version optimized for thermal soaring.

Planform

Layout follows that of previous designs in that it uses a constant chord wing with the span increased to up the aspect ratio and wing area. I decided to stick with a Rieger section and selected the AR2411-S77 as it is predominantly flat bottomed making it ideal for built up rib construction. It is reported to be better than AR2610-S80 (a section I have previously used) for thermalling and besides Alfons had already used it on his Wega Thermik design.

For ease of transport I made the decision to build the wing in three pieces with the center section permanently fitted to the fuselage. Polyhedral was employed and for looks I swept back the tip panels by two inches.

Control surfaces

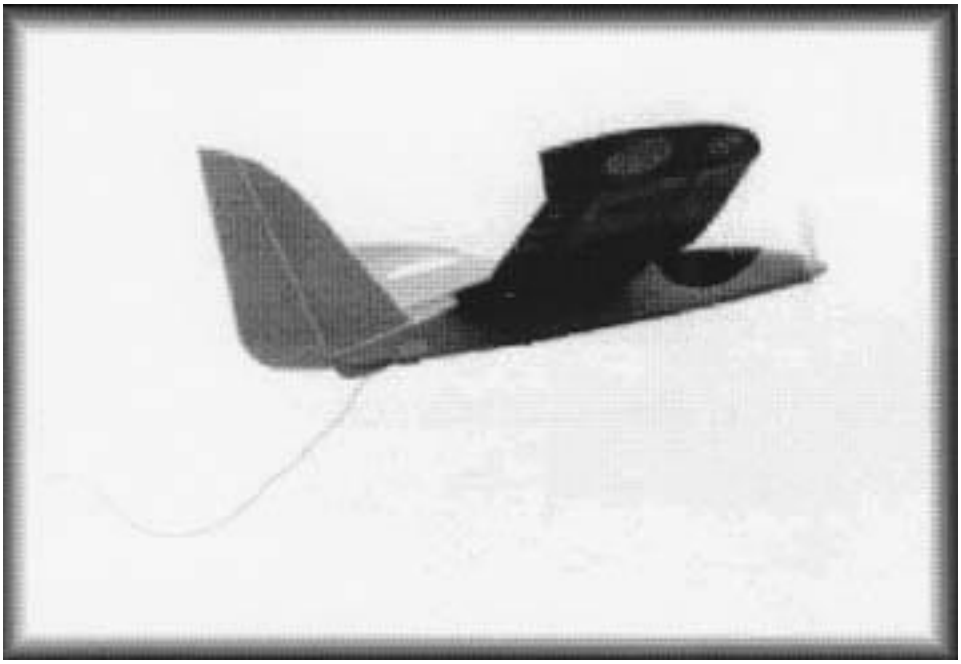
As a departure from previous designs I used a conventional rudder with central elevator. The main reason behind this thinking was that I did not want to have to connect up wing mounted servos. This way all radio gear was fitted within the fuselage, and tip panels are a simple piano wire dowel and incidence peg fit. By recessing the fuselage, the elevator could be kept as one piece. This makes connection to the servo very straightforward. Electrics are my usual package of 6V Speed 400 motor, 7X Sanyo 600AE cells and in this case a 6 x 3.5 folding prop.

Flight testing and adjustments

I would be lying if I said that first time out she performed flawlessly. In fact on the first launch a forward CG and not enough reflex saw her flying into the ground before I had a chance to get my fingers back on the sticks. After a few more attempts with increased reflex I decided it prudent to give up for the day and make further adjustments back in the workshop where a check of the CG revealed that I had miscalculated the 20% MAC position due to the sweep of the tip panels.

Hand launching an out of trim model carrying several ounces of dead weight doesn't do much for the structure, so in an attempt to preserve the model I removed the speed controller and 600AE battery pack replacing them with a 250mAh Rx battery in the nose.

Next time out I tried a few hand launches from the slope, each time moving the CG back and reducing the reflex until I was happy to reinstall the larger battery pack.



My flight log shows that she made her first flight under electric power on 31st January 1998 in far from ideal conditions. The next session was two weeks later, and I recorded a 30 minute flight making use of some excellent air. One peculiarity, which almost caught me out on the early flights, was a marked pitch up on applying power. I found that I could launch at half throttle which minimized the effect and have changed to a prop with a little less pitch, but it was very easy to induce unwanted oscillations as I over compensated with down elevator.

In an attempt to cure this I increased the down thrust from eight to ten degrees, but surprisingly it had little effect. The best solution has been to mix some down elevator to motor. This was not a problem encountered with my previous designs. In fact most needed some up trim at launch which could be removed as flying speed increased. To date my log shows 102 flights and it has become obvious that this model prefers calmer conditions and excels when lift is available.

Results

I feel that at 7.5 oz./ft.^{2} the wing loading is a little low for general conditions and I now believe that she would perform better if the wing loading was a little higher, as applying down elevator when flying in windier conditions only helps bring her down quicker.

Although not the complete success I had hoped for, this design has taught me a lot about plank type wings and their application to thermal soaring. As mentioned above I am sure that she would tolerate a higher wing loading, or perhaps a section with a little less camber and a lower pitching moment would help with the launch.

CG location I found was critical and I made constant adjustment along with that of the elevator trying to find optimum positions. If I were to build the same model again I would definitely drop the central elevator and return to elevon control but probably retain the rudder function. I must have hit upon a good fin, rudder and polyhedral combination as she is very stable in yaw enabling very tight thermal turns to be made.

Modifications

A recent modification has been to increase the elevator chord to 25% that of the wing. I thought this was worth a try after reading a chapter on optimum elevator shape in "Tailless Aircraft in Theory and Practice." With no further changes I enjoyed a very good flight on a flat calm evening, but further attempts in slightly windier conditions were less successful when any slight upset would induce a stall which would eventually dampen itself out if left to its own devices. Reducing the reflex and moving the CG fractionally further forward has cured the stall and I believe less movement of the larger chord elevator reduces drag and has helped increase flight times in low lift conditions.

I am about to embark on the next stage of development that will ultimately end with a new model. Not wishing to make too many changes at once, I will firstly build a new wing employing a thinner section with a little less camber hopefully proving my theory that at 11% thickness the existing section is a little thick for the relatively low wing loading.

Other thoughts

I have recently reread an article by the late Theo Gordijn in which he relates wing thickness to wing loading and suggests wings should be flown at higher loadings. The section chosen for my Sushi RE design would require the model to be double the weight. In his article he states a "rule of thumb" whereby section percent thickness is equal to three times the square root of the wing loading in ounces per square foot. My earlier electric planks flew at wing loadings ranging from nine to 12 oz./ft.^{2} with nine to ten percent thick sections and all exhibited good glide performance and just happen to comply with Theo's rule.

Other changes to be incorporated in the new design will include foam construction and a return to elevon control surfaces as employed on my previous designs.

We're always eager to hear about the tailless designs of *RCSD* readers. If you have a project you'd like to share or a question you'd like to see answered, contact us at P.O. Box 975, Olalla WA 98359-0975, or by e-mail at <bsquared@appleisp.net>.

Resources

The Sushi RE appeared as a plan and construction article in the February 2000 edition of *Electric Flight International* magazine. Traplet Publications Ltd., Traplet House, Severn Drive, Upton-upon-Severn, Worcestershire, England WR8 0JL. Traplet Distribution USA Ltd., 3103 Tatman Court Suite 105, Urbana IL 61802 USA. <www.traplet.com>

Nickel, Karl and Michael Wohlfahrt. Tailless Aircraft in Theory and Practice, translated by Captain Eric M. Brown RN. American Institute of Aeronautics and Astronautics, Inc. Washington DC, 1994.

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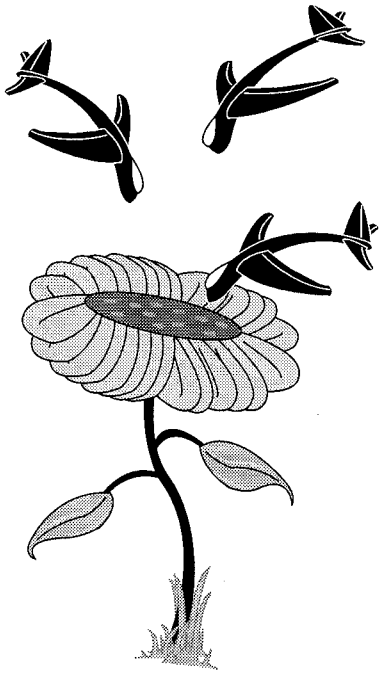


ZIKA

SCHEDULE OF SPECIAL EVENTS

May 3-5, 2002
Texas National — Seagoville, TX
Tournament (TNT)
Pancho Morris (UNL), (972) 681-1098
Lynn Williams (UNL), (214) 321-3005
Jim Truitt (RES), (214) 327-4441
Tim Bennett (HL), (972) 462-0784

May 4-5, 2002
ISR — Davenport, CA
Craig Toutolmin
craig@thehelix.com
www.sloperacing.com/isr2002.htm

May 17-19, 2002
Midwest Slope Challenge — Wilson Lake, KS
www.alltel.net/~mwsc

May 25-26, 2002
Spring PSS Slope Festival — Cajon Pass, CA

June 7-9, 2002
Montague Cross Country — Montague, CA
Challenge - 5th Annual
Dean Gradwell, (541) 899-8215
dean@xcsoaring.com

June 21-23, 2002
Mid-South Soaring — Atlanta, GA
Championships
www.atlantasoaring.org
Tim Foster, (770) 446-5938

July 27-Aug. 3, 2002
LSF Soaring NATS — Muncie, IN

Aug. 31-Sept. 2, 2002
SOAR UTAH — Salt Lake City, UT
www.silentflyer.org

September 13-15, 2002
Last Fling of Summer — Broken Arrow, OK
Dave Register, (918) 335-2918
regdave@aol.com

February 1-2, 2003
Southwest Classic — Phoenix, AZ

Please send in your scheduled 2001 events as they become available!

(continued from page 5)

yourself in this situation, cut the line, hook up a new arrow, and try again. That's probably the wise choice, however we're a frugal bunch, and Frank wanted the arrow back, so he decided to just pull on the line and break it free.

What's the rating on the winch line *you* use? 150, 180, 200 lb.? Ever tried to break it by just *pulling* on it? (I know, I know, it happens all the time while you're launching planes, right!) Well, Frank wrapped some of the slack around a stick to create a handle, and began to pull. The branch of the tree bent a bit, but the harder Frank pulled, the harder the tree pulled back, and the arrow (and line) held secure! Frank soon found himself pulling back with all of his body weight against the line.

The line wasn't breaking, but Frank wasn't giving up, he was just getting madder and madder, and uttered something to the effect of "come on, dammit, let go!"

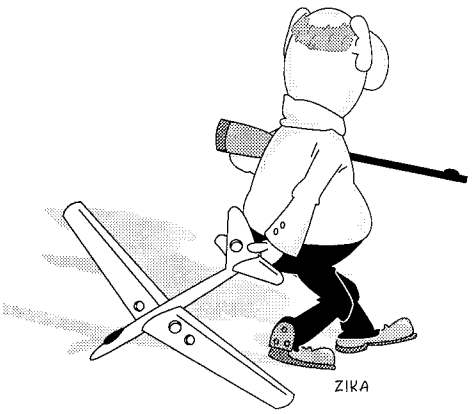
Well, that must have pissed off the tree, 'cause all of a sudden the tree fired back!

I heard a sharp snap (*not* the sound of a line breaking), looked up and saw the arrow suddenly come shooting downward out of the tree, on a trajectory straight toward Frank. Before anyone could even think to yell a "head's up", the arrow flew back and securely stuck into.....

...the ground between Frank's feet!

You cannot even begin to imagine the look on Frank's face. (But if you can picture Snoopy on his shot-up red doghouse, shaking his fist at the Red Baron, you can come close!) Obviously, trying to break the line was the wrong approach!

Suffice it to say that we eventually DID get a successful shot over the tree, and DID pull the poly rope over, and DID manage to bend (break actually) the branch holding the plane, which flat-spun down to the ground and landed without *any* damage. ("Click", 18 hours, 56 minutes and 15 seconds... no landing!) In fact, the plane was in such good shape, he could have quick-charged the battery and continued with the next round. (However, he chose to ponder its health more closely



over the bench at home that evening. Probably a wise choice.)

I sort of feel that if you fly around trees you'll eventually find an opportunity to land in one. A $1000 worth of plane stuck in a tree will motivate people to do strange things. Climbing them usually isn't a good idea. Shooting a line with an arrow isn't a bad idea! (Ever tried to *throw* a rock with line attached up and over something? It's amazing how high you CAN'T get!) Just be sure to bring more than one arrow! If one gets stuck, forget it and go one to the next. You'll probably spend more telling the story at a bar over a beer, anyway. ■

Mirko Bodul

"The Sloper's Resource"

By Greg Smith
greg@slopeflyer.com
http://www.slopeflyer.com

Sloping: Nationwide!

When most soaring types think sloping they usually think California and that is after they get over the idea that you really can fly in "all that wind." Well, I am here to tell you that sloping has been gaining popularity in most areas of the country where there are hills and it doesn't take a mountain; sometimes a molehill will do. I am in Wisconsin and we have some great sites here including several along the bluffs of Lake Michigan and The Big M in Platteville. Just around the bend at the foot of Lake Michigan is one of longtime sloper and all around great guy Dave Hauch's favorite spots, Mt. Baldy. There are popular slopes on Cape Cod, on North Carolina's Outer Banks, several spots in Pennsylvania, Virginia and Ohio as well as Kentucky. Flat as a pancake Florida has Mt. Trashmore, a sanitary landfill put to good use. There is great sloping in the Midwest in Minnesota, Kansas at Lake Wilson, South Dakota, Oklahoma and Nebraska. Texas boasts several sites as does New Mexico, Colorado, Idaho and Montana. Arizona has an active contingent as does Nevada plus all the hot spots in Washington, Oregon and California. I am sure there are other slopes out there; in fact I know there are, because I have many more listed on slopeflyer.com. The point is, sloping is growing all over the country.

It figures with all the great sloping around the country and the ability of the web to connect people and places that there have been pilots out there quietly flying their local hills for years who are just now getting recognized for their skill and dedication to the sport of slope soaring.

Mirko Bodul has been flying the bluffs of Lake Michigan in the Milwaukee area for over 20 years and Mirko doesn't fly small planes either. He has 3, 4 and 4.5-meter scale planes, F3B style ships, a Rodent, PSS planes and several Vern Hunt wings in his hangar. Mirko lives for the big wind, strong lift days where he can let his big planes run. The sight and sound of a large, scale ship doing a close in pass is something that will long be remembered. It is even more impressive in a location where you don't normally see that kind of thing.

Mirko has made pilgrimages to many of the sloping meccas in the US as well as several in Europe. He brings back to our humble neck of the woods knowledge and modeling trends from all over. Mirko is definitely one of the main conduits of sloping news in Wisconsin.

Mirko is also a tireless promoter of sloping and carries a card with his contact info. as well as the slopeflyer.com web address wherever he is flying. If a spectator shows interest when we are flying, Mirko is usually the one to answer their questions.

Russ Whitford is another Wisconsin resident who has been tossing models into the wind for years. Russ is an avid builder of all types of model aircraft, R/C, indoor and freeflight. He has a vast store of knowledge and has helped many local modelers including me improve and expand their skills. Russ's favorite slope is the bluff at Big Bay Park near Milwaukee. It helps that the hill is 5 minutes from his house!

With Russ's free flight roots, smaller, lighter planes are his choice for slope ships. The lighter planes give him the opportunity to fly his local slope at Big Bay more often and in lighter breezes. The SH-50 that Russ co-designed with me is a prime example. It is a Kevlar and glass sloper with a 50-inch span that comes in at about 17 ounces. Like Russ's other planes, it is built tough and, when the wind comes up, the ballast goes in, so the fun can continue. If you are in the area on a Northeast

Russ Whitford

wind day, it is likely you will see him on the slopes.

Russ, like Mirko, has done extensive traveling and usually tries to find a way to pack a slope plane or two. One of his favorites for its compact size and its ability to fly even the smallest slope is the Thermal Gromit Works Red Herring. He also has an Airtech Pixel and a Birdworks Zipper that make great traveling planes.

There are guys, just like Russ and Mirko, flying all over the country, maybe at a hill near you. Find them and fly with them, some of the finest people in soaring are slopers!

If you have a story about a local slope or just a great slope story in general, why not write about it here in the hallowed pages of *RCSD*! Contributions are always welcome.

Next month, I plan to have coverage of the first F3F event in the US outside California that is happening at Wilson Lake in Kansas. Wilson Lake is the site of the popular Midwest Slope Challenge in May and this first event is a tune up for an F3F event to be held in conjunction with the Man on Man and Combat events already slated. Stay tuned for more slope action!

■

GORDY'S TRAVELS

Gordy Stahl
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GordySoar@aol.com

I have said it before and I still maintain that one of the great parts of traveling with sailplanes is all the neat guys I get to meet. A few years ago I met up with Edgar Vera over the internet on the *Radio Control Soaring Exchange*.

Known as the "Soaring Junkie," Edgar was often described as "over eager," but he and I bonded immediately because we both had great love of RC Soaring and Sailplanes. We both were very much into new sailplane technology and both had an intense thirst for the hobby.

This past October, at Visalia, California, the CVRC's Fall Soaring Festival (arguably the most prestigious and most fun TD contest in the world)... Edgar won! In the company of some of the most talented, experienced RC sailplane thumbs, Edgar Vera won!

So, I asked him to fill us in on what it's like for a mere mortal to win in that environment and what it took to achieve it. Here's his story:

Edgar Vera's Story
Questions & Answers -
What led up to
Visalia 2001 and after?

by Edgar Vera

1. What was your soaring experience, prior to focusing on contest flying?

Slope soaring was where this craze of RC flying all started for me, about 3 years ago on Temple Hill. Met a great bunch of guys who exchanged some great ideas for improving my building & flying skills. To this day, I still keep in touch with this core group of guys. There's something about this hobby that provides a common ground for all of us to enjoy together, combat was our main enjoyment and it grew from there. Steve Patton provided many of our combat ships, to tear up the sky and improve our crashing skills without compromising our friendship in the process. When it comes to EPP, there's very little, if at all damage that occurs when these planes come in contact with another. If this type of flying existed with some of today's molded planes, well I'm sure some feelings would be hurt and enemies would be made.

Then, one day, the subject of Thermal Duration flying came up and a few of us slopers decided to visit one of the local flying clubs in our area, Silent Wings Soaring Association (SWSA). These guys welcomed us foam guys, while mumbling some joke about, "Foam is for chicks"... Well, it was something like that in the beginning. Dan Borer was one of the slopers that decided to tackle this Thermal Duration (TD) stuff and found a way for me to take an interest in this new area of flying. Glad he did, it's been fun ever since. I think we were a shot of "New Blood" and that the club benefited from our new membership.

2. What planes did you like the most?

Being out in Southern California helps us enjoy flying all year around; you can find many thermal clubs around that host monthly TD contests for their own members, and visiting pilots are always welcome to join in. After attending some of these early contests, as a spectator only, I began to learn about the many different types of planes that were currently available, not to mention their pretty price tags as well.

There were a handful of pilots that I noticed were always consistent in finishing in the top positions. I naturally thought it was the plane that helped them achieve this accomplishment. So I began the chasing of recent contest winning planes to add to the newly formed hanger. My thoughts back in those days were, "In order to win like some of these guys, I will have to fly the same type of planes." Well, this was one big false notion that ended up giving me my a.k.a nickname as "The Soaring Junkie" among my close flying buddies. If it was a soaring TD plane, I had to have it.

I tried the European molded models down to some great balsa built RES planes. The molded stuff was way too pretty for the thought of competing with them; I didn't want to get a scratch on them. These were the Cadillac's for soaring, the planes you only take out to enjoy on Sundays while getting these planes to wink back at you with their shiny reflections from 1000 feet above. Then there are the carbon/glass wing lay-ups types of planes (the Sapphire CGTs, Addictions, Schpotdorkers, etc...) that are, in my opinion, perfect for AMA type of TD flying.

Fred Sage (fsage1@utm.net) is one well-known person from Poway, California, who will produce just about any type of wing for you. Send him the span, foil, and taper you want and he'll produce a fine set of wings for any fuse you want to join up with glass wings. His Addiction line has proved to be one of my favorite planes for TD. It has been my weapon of choice for the past 1.5 years. If a wing gets damaged, he can provide you with new parts to get you back up into the air. Damaging a molded plane is another story, especially if the planes are made overseas. This was another reason for me to choose a foam core, bagged, composite-skinned wing, plane for contest flying. There are other excellent bagged-wing TD planes made by other manufacturers, but I'm giving Fred's as an example because I'm very familiar with his plane and would recommend them to everyone.

3. What specific things did you do to get focused for winning prior to Visalia?
(For instance, did you always fly tasks when practicing, including shooting landings?)

When trying to improve my skills for TD flying, I would always volunteer to time for some of the top pilots that were in need of a timer, which provided me with a better understanding of how you need to fly to win at TD contests.

When I had the chance to show up at my club's (SWSA) field, I would try to practice Task flying. Some members suggested trying to fly while listening to a recording of a timed flight time (3 min., 5 min. tasks, etc...) in order to give me a true feeling of how a TD contest should be flown.

Learning to thermal was my first priority, and I would spend many flights trying to learn where a thermal would be lurking in the surrounding areas. After I felt comfortable with finding or at least recognizing when my glider flew through a thermal and using them in making my flight time task, the shift of my focus was in practicing to land on the money (both time and spot are dead on).

Many hours were spent on reading glider energy and how to manage this energy on final approaches. After all, today's Soaring contests are primarily 'LANDING' contests and the best spot landing pilot will usually win the contests. Once landings are mastered, then you'll have a fighting chance to walk up to collect some hardware at any normal TD contest.

4. Who was the greatest influence on your becoming disciplined toward contest flying?

One of the reasons why I picked up on TD flying quickly is all due to my mentor, Fred Sage. I knew in the beginning that if I wanted to get better quickly at TD, I should learn from the people that know what they are doing. I spent months and months trying to get Fred to open up to sharing some of this flying knowledge with an aspiring new pilot. Until one day, when he made me prove just how serious I was in taking my flying to the next level.

He agreed to share some insights but he wanted to make sure I was serious about learning; one thing I've learned about this man, he never does anything half-a#$!! I had to drive (1.5 hours away) south to meet up with him; this was a means for him to gauge how serious I was about learning. I guess he figured that if I was willing to drive all that way then I was serious about learning how to fly from him.

It proved to be the best thing I had ever done regarding this side of the hobby. Fred has an indirect way of teaching TD; I had to figure out what it was he was trying to get across. There were no previews of what we were going to cover, we just launched our gliders and he would give some hints as to what was going on in the air. Then, what the corrections were in order to provide the most effective means to find those hot air pockets around the area.

2001 Visalia Champion
Edgar "The Soaring Junkie" Vera

Then came the landing practice sessions. These were the hardest tasks to pickup on, time references are the key to consistent landing scores and having a glider perfectly trimmed out so you can take full advantage of the flight task at hand.

This is the best tip I would offer to any pilot that is seeking to improve their TD skills: pair up with a pilot who is flying at a level you want to reach. They can cut your learning curve time by more than half. It might not be easy to get their assistance at first, but keep trying - a little persistence goes a long way.

5. What tips were you taught to help you read air, and make landings?

Reading air is a tough thing to do. If it were easy, then everyone would be making their flight task at each contest you come across. You just have to go through a checklist of indicators and, above all, need to be patient in this department. Look for birds that might be circling while gaining altitude (dead give away of a thermal); look for little bugs going up around you. Of course, the easy way is to look at what the other gliders are doing around you; "The work smart, not hard" approach is always good to use.

As for landings, you can't do better than to get out and practice a 'routine', over and over. It's the only way you can learn how your glider will react to your input and the surrounding conditions. In other words, there's no easy way around this part of flying. Landings should be the main focus in developing your TD skills. We all know these are landing contests! (Never 'just' land, somewhere - work with a target!)

6. How many times a week (or month) did you practice?

With a family, getting out to my flying field is getting harder to do. I try to get out at least four times in a month to keep my skills sharp; you have to get out here (California) with all the competition around this region. You get World Champs that show up to any given contest out this way, so if you want to hang with the big boys; then you have to do your homework. Unless you're out just to have fun and take a break from TV.

7. Did you have a regular flying partner to practice with?

Practice outings take place whenever I can get the time to do them. I try to fly with the same group of friends, but we all have different schedules and that doesn't always work. This is another good reason to belong to an active soaring club - a sure way of always having someone to fly with at your local flying site.

The SWSA members are all soar-heads and they are always out flying, whether it's fun flying or practicing to improve their soaring skills.

That was another reason why I stuck it out in the beginning. When trying to learn how to thermal fly was frustrating for me, at least there were guys around to socialize with and talk about nothing but planes. Great bunch of guys to fly with and to add extra enjoyment to the day!

8. What radio did you use?

When it was time to select a radio system, I was not too sure of which way to go. In the process I tried several systems and I wanted to give them all a try before deciding which way to stick with. I looked at several points when trying to select the system to use for contest flying. Some of those points are as follows: ease of programming, memory space (have to when you have a hanger like mine), are others flying the same system? How is the service support, price of unit, ease of finding parts, and how did the Tx fit MY hand?

The system kept coming back to be the Futaba 8UAFS; it was popular in my area so I could ask someone for input on how to do some programming. The price was the best considering what you get in this radio. Besides, having Don Edberg's book (Dynamic@flash.net) didn't hurt in the decision process as well. It was the 'right' choice for me, because the criteria fit my situation and me. It wasn't the 'silver bullet' that created wins.

9. Did you practice with a bungee or always a winch?

Only when there is a contest coming up will I use a bungee to practice shooting landings, quickest way to keep getting back up in the air after aiming for that "100" spot on the tape. You get more reps. taking advantage of this method.

The winch is always good for practicing timing drills and making sure you have realistic contest conditions to deal with (cross winds, down winds, etc... to see how to counteract what your sailplane will tend to do). The only down fall is you can't re-launch as many times in the same given amount of time as when using a bungee, but it helps in trimming out your contest plane.

10. What advice would you give to someone wanting to 'go for wood' this coming season?

The best advice is to ask yourself how serious do you want to get for the upcoming season. Set goals and make a plan on what it will take to reach these goals and then just execute the plan. You have to practice if you want to get better at this hobby (sport) and try to get some help from other pilots that have the skills you want to attain. These guys are your greatest sources for tips and trade secrets; sometimes you just have to ask to be pointed in the right direction. Don't expect them to hold your hand because they are out to improve their skills as well, and they don't go out flying just to help YOU trim your plane. (Offering to buy them lunch doesn't hurt, if you want their help; it worked for me.)

11. Did you feel that you were a serious contender for a win at Visalia as you drove to the contest?

I think everyone deep inside feels they could win the big contest. If not, then why do they even bother competing?!? Luck has a big part in the equation as well, but you have to have your fundamentals in check if you hope to make it on the first page of any two-day contest. I personally felt I had a chance to do well. My goal going into Visalia was to do better than last time. As the contest progressed, I tried to just stay focused on the task at hand and not look at the round-by-round scores. They just make me think too hard on what needs to be done and this just makes me lose sight of my normal routine. (I still can't believe I placed first, as I've only been flying TD for 2.5 years and to win this prestigious contest makes me pinch myself every time it comes to mind.)

Looking back at what it took to get there, well, I did put many hours into getting my plane dialed in just right and I put in my share of divots into the ground trying to hit that "100 pointer". Practice paid off this past season and now I have to practice harder. Have to keep the skills sharp because I know others are doing the same thing. It's competition, not a give-away just because now I'm 'someone'. I still have to go out and earn it every round, until the last flight is done.

12. What were you thinking about after round one, and then in between the rounds as they progressed, especially going into the last round?

After round one, I started to breathe again. The butterflies were gone and I could focus on the goal, do the best I could. I tried not to think about the placing as the rounds went by, it only clouds the thinking process. You can ask any of my club members about how I feel about knowing the scores. I don't want to know!

Going into the last round was the worst, talk about putting the nerves on overdrive. The pressure was intense; I've never been this close to taking the grand prize. Lucky I had my favorite timer & mentor (Fred Sage) next to me to calm me down. He kept me focused on what got me in this position... focused on my flying and not about what is taking shape on the ground. Sometimes you need a good kick in the rear to keep on marching along.

13. Did you have a scary round?

The fifth round was one of my worst. I had just launched and was doing my normal search pattern when I realized I made a bad decision and turned the wrong direction to conduct my "feeling for air" pattern. The good air was to the far left of me and I had to get there quickly if I was to make something good out of this round. Just coming across the sky was proving to be risky. Talk about sink cycle, I had dropped about three hundred feet and things were not looking too good. (I heard after that round some of my club members were having a heart attack because of what they saw taking place.)

There was still three minutes to work and I was at about two telephone pole heights and dropping. Lucky, I had my timer looking out for activity around the field. He pointed me into a small thermal near by but heading down wind quickly. Well, I steered the Addiction into its path and worked my butt off for what seemed like eternity.

After making up some time and not really climbing that well, I decided to come home and settle for the time. You have to know when to call it quits and be happy with what cards you're dealt. Not having too much stored energy, my glider couldn't handle (at stall speed) too well on the final and I missed my first and only landing. Well it could have been worse and that round proved to have been the make or break round for lots of guys. Things still worked out for the best. I managed to make something out of nothing in the time department, and kept my points up instead of dropping to the second page or worse.

14. What was the result of your winning one, maybe the most prestigious TD Contest in the world, on your club mates?

With the Visalia win under my belt, I find myself the target of many jokes but pilots seem to listen to my suggestions now. One great thing that has come from this win. That's the shot of energy it has created among all my club members. When you come to our field to fly now, there seems to be more flying going on versus the old norm of too many members sitting down exchanging stories.

The practice level has increased, and another good indicator is our monthly club contest scores overall. Everyone is flying at the "Expert" level. The scores have improved in every category and that makes me feel great inside. It might not have been all my doing but I can say it has jump-started some of these guys.

The club participation in outside contests has grown and more guys are enjoying the little road trips that we find ourselves taking. The two-day contests are the best examples. We usually have the best-equipped camp area, complete with movies playing on a video TV and some great food to pass around. The club has taken a turn for the better.

My Visalia win was a great win for our club and I'm glad I have some good buddies to enjoy that special moment with. As far as I'm concerned, it was a team win that took place and I will do what I can to help others experience this feeling one-day soon. Another point, I have noticed my activity as a timer has increased dramatically...

15. Do you mentor other flyers in your club?

I'm doing my part to help others improve as well. I've tried to team up with different members for the year so I can assist them in anyway I can, to help them enjoy this TD flying thing. I fore-warn them to have a good set of ear-plugs if they really want me to time for them, because I give as many inputs as I can while I'm timing for them. They can choose which information to ignore and take heed of. After all, I'm timing for them which means that I'm their extra set of eyes to what is going on around them, while they keep their eyes set on their planes. I'm not just walking around with a timer counting down time, I'm giving them 110% - as I would expect my timer to do for me.

16. Are you still motivated to go for more wins?

The motivation has taken a new form. Yes, I still want to pursue more victories, but with this win I'm just not taking it as serious as before. I can now relax and know that I had my day in the sun already and it can happen again if all the conditions are just right as they were back in October of 2001. The pressure is not there any longer to prove I'm a good pilot. Of course, now I have to prove it was not a fluke. At least I can smile now and say I'm one of the lucky few to win the big one!

17. What plane are you going to be flying this season?

Why change what works? It got me to the top so why fix what is not broken? Actually, contest flying is starting to take its toll on my favorite plane and I think it's wise to build a new bird for this year's competitions. Fred Sage has a new plane coming out (Compulsion) and it might be the new toy to try out for this year. We will see. Have to put my name on that ever-growing long "waiting list." No, I don't get any special treatment in this department. Go figure!

18. Any final comments?

You bet! I was incredibly lucky at Visalia, but I worked hard prior to be ready in case the 'luck' was there waiting for me. See you guys on the field!

Edgar Vera
"The Soaring Junkie"
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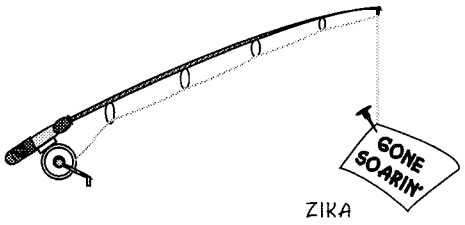

THE NATURAL SIDE OF THERMAL SOARING

By Lee Murray
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In some previous issues I showed you how we can gather information from the NOAA[1] database via the Internet and filter that information through software to quickly recognize good and bad soaring conditions. First, I'll give an example of "after the fact" type of analysis of an unexpected day and then an example of the predictive value of this information.

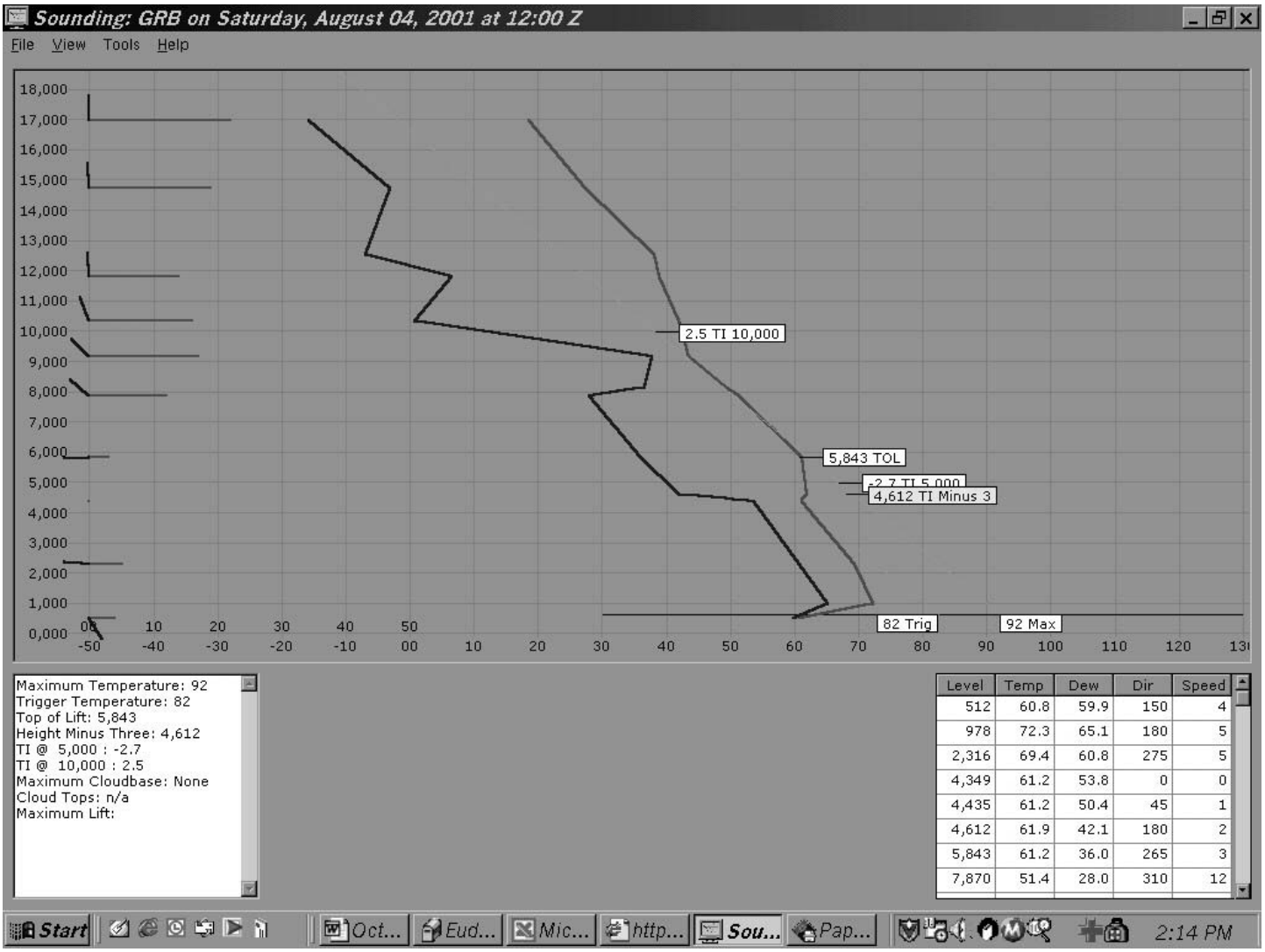
ANALYSIS OF AN UNEXPECTED GOOD SOARING DAY

Model flying is winding down here in WI. Our silent flight group is planning their projects for the winter and some have already been started. Each weekend I send e-mail to the electronically connected members of our Silent Flight Group of the Valley Areo Modelers and advise them of the weather forecast and what the soaring gods might have in store for the weekend. The local Yahoo forecast said on this October Saturday "Today...mostly cloudy...becoming partly cloudy in the afternoon. Highs around 40. Northwest wind 10 to 15 mph...turning west 5 to 10 mph during the afternoon."

Mostly cloudy, a little windy, cold … Who needs that? This wouldn't seem like the kind of day that would produce good results – Right? I didn't check the soaring forecast but thinking that without solar heating, nothing good would happen.

I advised the group that we should show up about 1 pm when the frost would surely be off the sod and it would be safe to walk on. I added that today would be a good day for electric models. I charged batteries to my Falcon 550e and threw it and the Highlander into the van. The Highlander was on a week old charge. I headed off to work with instructions to Bobbie, my wife, to call if someone was actually expressing interested in flying. Bobbie called and reported that three people were coming out including my 14 year-old student, Chris, with his Gentle Lady.

I noticed that there was more sunshine than expected at 11 AM but kept on working until it was time to leave. On the way out, it looked like the winds were higher than 15 mph and clouds were forming. I set up the winch and took a flight with the Highlander. I couldn't believe it, there was good lift. Chris arrived and launched his Gentle Lady. It was headed up in lift even though the model had a warped wing and a strut glued to one side of his fin



as a crude repair. I took his transmitter because it was going out of sight and got it down safely. We shared the Highlander afterwards having up to 10 minute flights. I'd launch and find some lift while Chris would get the parachute and return the line. Chris would take over after the retrieval and complete the flight. On one launch I got the plane to the limits of visibility in 3 minutes with 80% cloud cover. "How can this be?" I asked.

When I got home I plotted out the Soarcast[2] and Greg Ciurpita's soaring forecast program based on downloaded lapse rate information. Both showed that the 42°F high of the day under those conditions gave lift to 3,000+ ft. See the Soarcast graphic for this day. The lesson is that a favorable lapse rate makes a lot of difference.

PREDICTING GOOD DAYS TO FLY

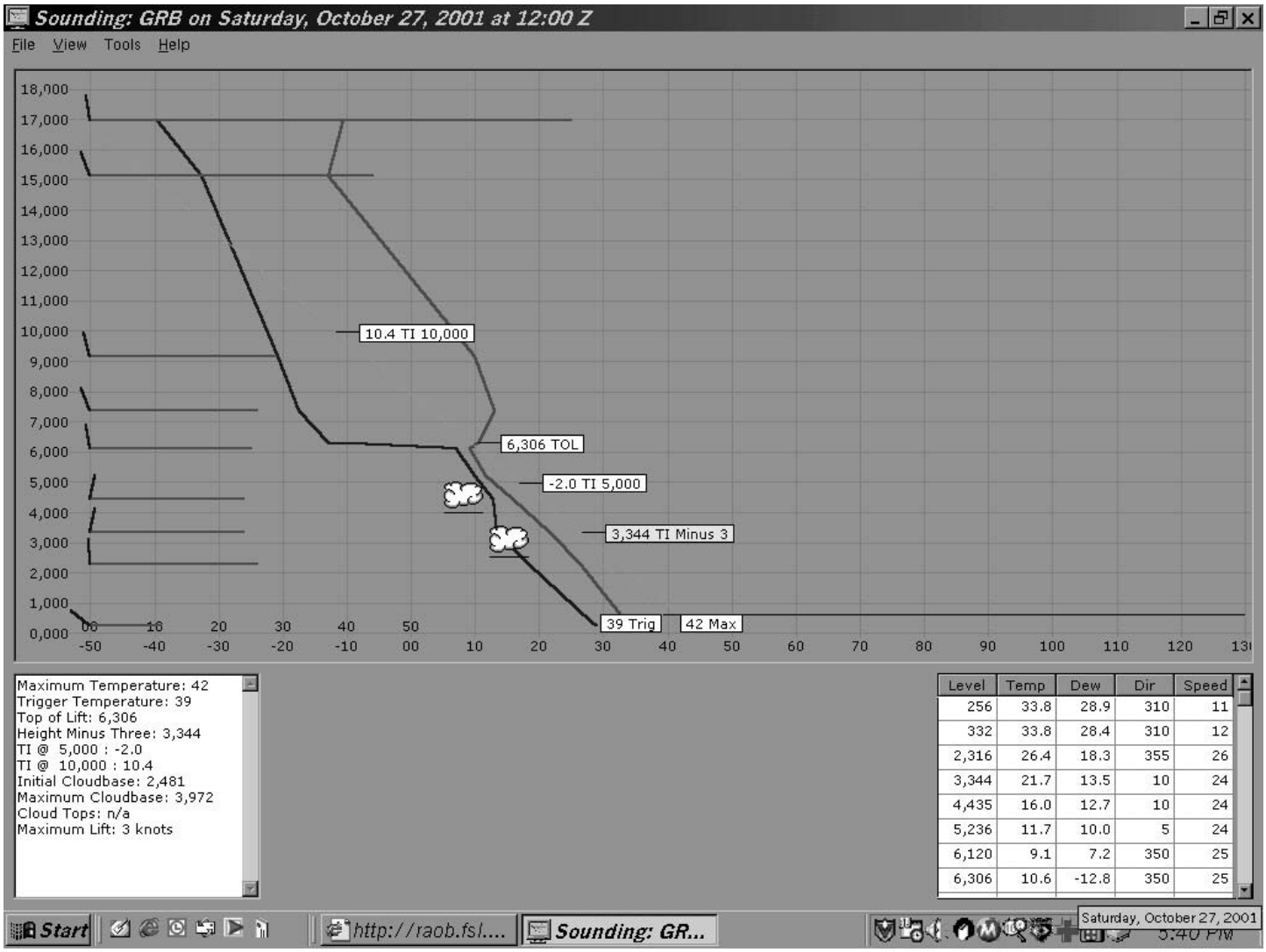
In another incident on August 4th, I had noted that the weather had been hot and dry. I remembered that I needed a two hour thermal duration flight for LSF level V. Saturday morning I clicked on the icon for Greg's soaring forecast "Appleton.tcl" and saw that we had a very favorable lapse rate with clear skies and low winds. I got a battery charged on my cross country model (Constellation) and got out to the field at 11:00. The temperature had reached a point where I could reach over 1,000 ft. I launched and flew for 1:42:47 in an attempt for my LSF level V, 2 hour thermal duration task. The lift was light at first but kept getting stronger. At one hour it was like I couldn't get away from lift and I was using flaps to control the dive speed to keep the model from going to the 10,000 ft. maximum that was being predicted. Then there was a lull in the action where I could only find small thermals and I had to land. I had become the victim of a long and strong period of subsiding air that followed the exceptional lift cycle. This is probably the best example yet about the usefulness of the soaring forecast data for RC soaring enthusiasts. It's just as well that I didn't fly over 2 hours since my flight pack was weak and I didn't have any remaining battery capacity according to my battery cycler.

Comments on the Highlander Foamy

Our club had a Highlander foamy building project last year. We ordered 13 of them from MAD Aircraft Design. They were built with several variations:

1. ***Standard kit*** - The standard Coreplast® tail seems to flutter easily on launch. The reinforced tape on the fuselage and wings allows hefty launches.

2. ***Standard but with the balsa fin, rudder & stab shown in RCSD*** - The tail is tough but



you better reinforce the rudder and elevator control horn mounting locations with fiberglass as recommended in the *RCSD* article[3]. At high speeds the wing flutters but you can recover without damage.

Highlander wing with two piece wing and wood fuselage with more wood used on the wing vs tape. This requires the model to be launched like a Gentle Lady. In windy weather the extra weight doesn't matter.

The version 2 that I built is very reliable, fun to fly and can be shared with new and novice fliers without worry. In several cases it made the difference between me and them being too afraid to fly the "expensive sailplane" and them actually flying. My most successful approach in getting someone with some training to take control of the Highlander seems to be to hand them the transmitter as soon as they walked onto the field. Tell them that they can't hurt it and that it will fly itself if they don't do anything. Let them learn as you give suggestions starting with only rudder controls. Then get them to add a little elevator with the rudder to make flatter turns. Finally, get them to make figure eights in the sky if wind speed is low. Getting a new flier to fix porpoiseing (climb, stall & recover) is perhaps the most difficult to learn. In most cases these novices are older members who never quite learned to fly well. The Highlander, like a Timex watch, "takes a licking and keeps on ticking." It flies better than many 2M wood RES models I have had.

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1 National Ocean and Atmospheric Administration

2 *Soarcast*© is a computer program that reads an atmospheric sounding file and displays the results on a Stüve diagram along with a forecast of the soaring conditions. It supports several different file formats including NOAA FSL, University of Wyoming and the format used by the Kevin Ford sounding web site. Additional formats can easily be added without having to update the software. *Soarcast*© also provides a means to manually enter a local sounding using dry bulb and and wet bulb temperatures.

3 Register, Dave and Govek, Jeff, Highlander 2M EPP Foamy *RCSD*, August, 2000, pg 8

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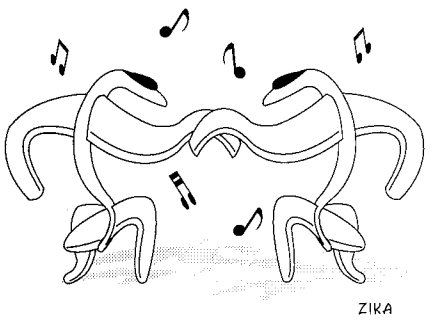

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For Sale - Business

PARACHUTES: $12.50 (includes S&H U.S.A.) Send check or money order to Dale King, 1111 Highridge Drive, Wylie, TX 75098; (972) 475-8093.

Reference Material

Summary of Low-Speed Airfoil Data - Volume 3 is really two volumes in one book. Michael Selig and his students couldn't complete the book on series 3 before series 4 was well along, so decided to combine the two series in a single volume of 444 pages. This issue contains much that is new and interesting. The wind tunnel has been improved significantly and pitching moment measurement was added to its capability. 37 airfoils were tested. Many had multiple tests with flaps or turbulation of various configurations. All now have the tested pitching moment data included. Vol 3 is available for $35. Shipping in the USA add $6 for the postage and packaging costs. The international postal surcharge is $8 for surface mail to anywhere, air mail to Europe $20, Asia/Africa $25, and the Pacific Rim $27. Volumes 1 (1995) and 2 (1996) are also available, as are computer disks containing the tabulated data from each test series. For more information contact: SoarTech, Herk Stokely, 1504 N. Horseshoe Circle, Virginia Beach, VA 23451 U.S.A., phone (757) 428-8064, e-mail <herkstok@aol.com>.

BBS/Internet

Internet soaring mailing listserve linking hundreds of soaring pilots worldwide. Send msg. containing the word "subscribe" to soaring-request@airage.com. The "digestified" version that combines all msgs. each day into one msg. is recommended for dial-up users on the Internet, AOL, CIS, etc. Subscribe using soaring-digest-request@airage.com. Post msgs. to soaring@airage.com. For more info., contact Michael Lachowski at mikel@airage.com.

International Scale Soaring Association

There is a growing interest in scale soaring in the U.S. We are dedicated to all aspects of scale soaring. Scale soaring festivals and competitions all year. Source for information on plans, kits, accessories and other people interested in scale. For more information, write to:

International Scale Soaring Association
37545 Oak Mesa Drive
Yucaipa, CA 92399-9507
e-mail: 70773.1160@Compuserve.com
web site: www.soaringissa.org

Books by Martin Simons: "World's Vintage Sailplanes, 1908-45", "Slingsby Sailplanes", "German Air Attaché", "Sailplanes by Schweizer". Send inquiries to: Raul Blacksten, P.O. Box 307, Maywood, CA 90270, <raulb@earthlink.net>. To view summary of book info.: http://home.earthlink.net/~raulb

T.W.I.T.T.

(The Wing Is The Thing)

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines. Full information package including one back issue of newsletter is $2.50 US ($3.00 foreign). Subscription rates are $20.00 (US) or $30.00 (Foreign) per year for 12 issues.

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The League of Silent Flight (LSF) is an international fraternity of RC Soaring pilots who have earned the right to become members by achieving specific goals in soaring flight. There are no dues. Once you qualify for membership you are in for life.

The LSF program consists of five "Achievement Levels". These levels contain specific soaring tasks to be completed prior to advancement to the next level.

Send for your aspirant form, today:

League of Silent Flight
c/o AMA
P.O. Box 3028
Muncie, IN 47302-1028 U.S.A.

http://www.silentflight.org

Sailplane Homebuilders Association (SHA)

A Division of the Soaring Society of America

The purpose of the Sailplane Homebuilders Association is to stimulate interest in full-size sailplane design and construction by homebuilders. To establish classes, standards, categories, where applicable. To desiminate information relating to construction techniques, materials, theory and related topics. To give recognition for noteworthy designs and accomplishments.

SHA publishes the bi-monthly ***Sailplane Builder*** newsletter. Membership cost: $15 U.S. Student (3rd Class Mail), $21 U.S. Regular Membership (3rd Class Mail), $30 U.S. Regular Membership (1st Class Mail), $29 for All Other Countries (Surface Mail).

Sailplane Homebuilders Association
Dan Armstrong, Sec./Treas.
21100 Angel Street
Tehachapi, CA 93561 U.S.A.

The Vintage Sailplane Association

Soaring from the past into the future! The VSA is dedicated to the preservation and flying of vintage and classic sailplanes. Members include modelers, historians, collectors, soaring veterans, and enthusiasts from around the world. Vintage sailplane meets are held each year. The VSA publishes the quarterly BUNGEE CORD newsletter. Sample issues are $2.00. Membership is $15 per year. For more information, write to the:

Vintage Sailplane Association
1709 Baron Court
Daytona, FL 32124 USA

The Eastern Soaring League (ESL) is a confederation of Soaring Clubs, spread across the Mid-Atlantic and New England areas, committed to high-quality R/C Soaring competition.

AMA Sanctioned soaring competitions provide the basis for ESL contests. Further guidelines are continuously developed and applied in a drive to achieve the highest quality competitions possible.

Typical ESL competition weekends feature 7, or more, rounds per day with separate contests on Saturday and Sunday. Year-end champions are crowned in a two-class pilot skill structure providing competition opportunities for a large spectrum of pilots. Additionally, the ESL offers a Rookie Of The Year program for introduction of new flyers to the joys of R/C Soaring competition.

Continuing with the 20+ year tradition of extremely enjoyable flying, the 1999 season will include 14 weekend competitions in HLG, 2-M, F3J, F3B, and Unlimited soaring events. Come on out and try the ESL, make some new friends and enjoy camaraderie that can only be found amongst R/C Soaring enthusiasts!

ESL Web Site: http://www.e-s-l.org

ESL President (99-00): Tom Kiesling (814) 255-7418 or kiesling@ctc.com

INTERNATIONAL MAN-ON-MAN
SLOPE RACING 2002

May 4-5
Davenport, California

Unlimited Man-on-Man Slope Racing on the California Coast

- **Entry Fee $30**
- **Pilots must be current AMA members**
- **Registration limited to 30 pilots**
- **Top Prizes include**
  - ~ Stratos SR fully-molded racer for winner
  - ~ Acacia II fully molded racer for volunteers' raffle
  - ~ and much more!

Sponsors of this event include:

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Big Raft Creative Media

INTERNATIONAL SLOPE RACING

Send entry fee, full name, AMA number, contact info, primary and alternative frequencies to:

Barry Baskin c/o ISR Race
941 Walnut Avenue
Walnut Creek, CA 94598

for more info
email Craig Toutolmin:
craig@thehelix.com
or go to:
www.sloperacing.com/isr2002.htm