Radio Controlled Soaring Digest

September 2007 Vol. 24, No. 9

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Front cover: Roger Robbins, a fellow member of the Ivinghoe Soaring Association, launches Dave Woods' Airworld Modellbau 1:3.5 scale Fox. For more information and photos, see the article starting on page 52. Photo by Mike Shellim. Pentax K100D, ISO 200, 1/1250 sec., F4.5, 21mm.

Back cover: Greg Smith <www.slopeflyer.com> used his Nikon D200 to photograph Dave Garwood's "Pinball" Bell P-63 Kingcobra, built from a Leading Edge Gliders kit, at the Mohawk Trail slope flying site in North Adams, Massachusetts. Dave Garwood says, "The yellow color scheme was used for an unusual mission — flying as an aerial gunnery target for B-17 crews. The skin of the target aircraft was strengthened, and the gunners fired frangible bullets at the 'Cobra, with hits signaled by a flashing light system." Main image: ISO 100, 1/2500 sec., f4.5, 200mm Inset: ISO 100, 1/1000 sec., f2.8, 75mm

R/C Soaring Digest

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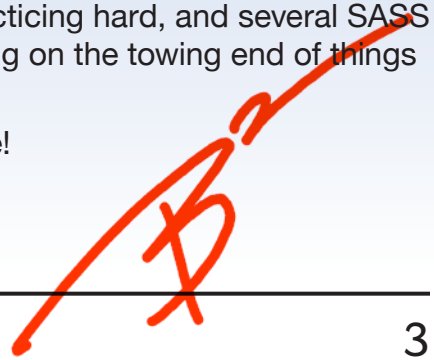
In the Air

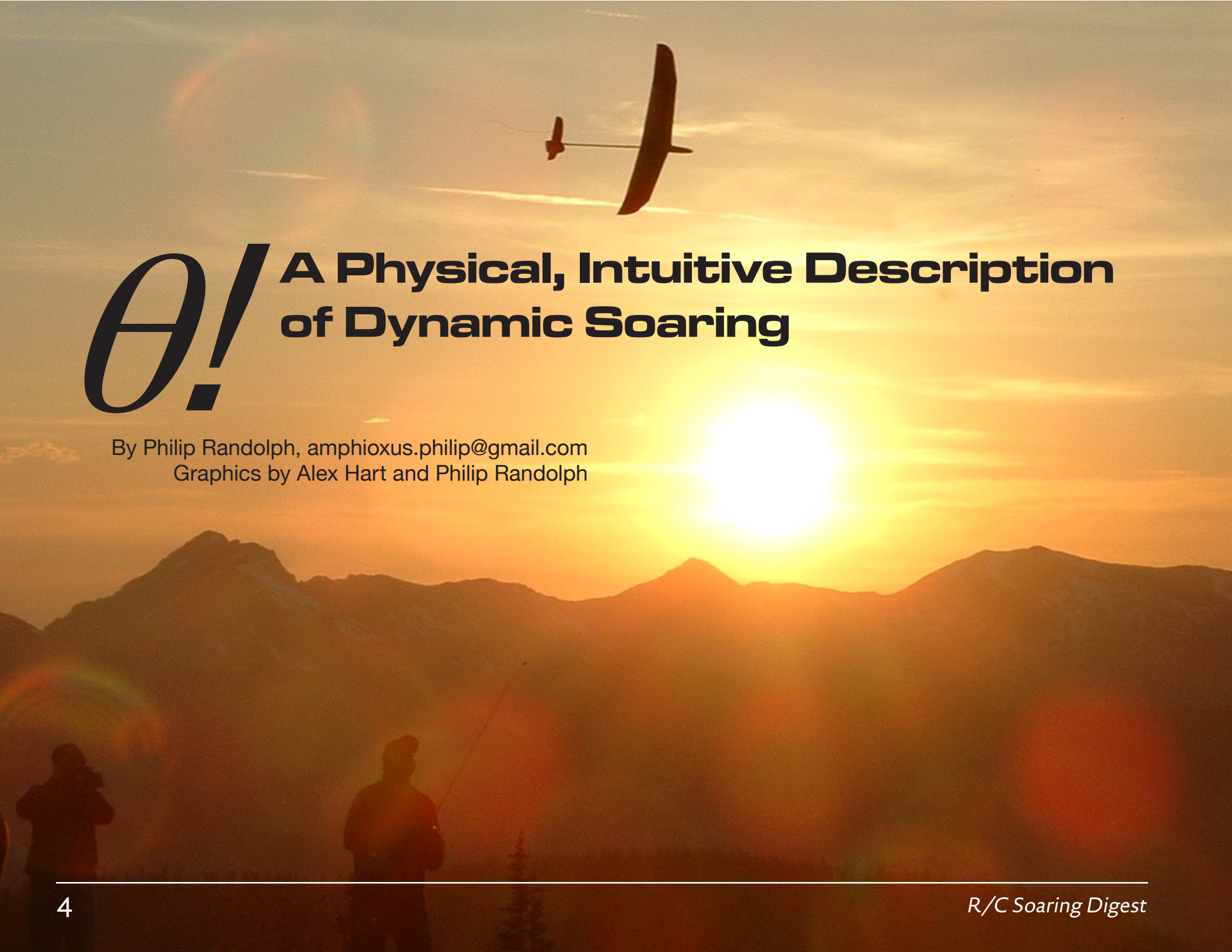
This issue of *RC Soaring Digest* is rather unique in that it features multiple articles by multiple writers - three articles by Tom Nagel, and two by Philip Randolph. We've been receiving positive comments regarding previous materials by these authors, and we're sure you'll enjoy their latest offerings.

We continue to gather information about components for Simon Nelson's retriever (May 2007 issue). Surplus Center, Lincoln Nebraska, has a suitable winch motor <http://www.surpluscenter.com/item.asp?UID=2007082410251524&catname=winches&qty=1&item=10-1839> and switch box <http://www.surpluscenter.com/item.asp?UID=200708241025152 4&catname=winches&item=11-1569>. Wiring diagrams for these items can be viewed by clicking on the appropriate tab within the item window.

Despite the wet weather here in the Northwest, we've been able to spend quite a bit of time out at 60 Acres South, home field for the Seattle Area Soaring Society. While some of our time at the field is devoted to flying, a good portion lately has been devoted to assisting the three SASS Juniors who will be participating in the F3J trials over the Labor Day weekend. Brendon Beardsley, Connor Laurel, and Michael Knight have been practicing hard, and several SASS Members have found that being on the towing end of things can be an exciting experience.

Time to build another sailplane!





θ! A Physical, Intuitive Description of Dynamic Soaring

By Philip Randolph, amphioxus.philip@gmail.com
Graphics by Alex Hart and Philip Randolph

How the opposing velocities of a couple of air currents can add so much velocity to a model or full-scale glider or bird.

Third and final thrilling monthly installment: More ways to DS more terrains, and a bit of conjecture - how fulmars and northern petrels DS waves

Where from — review

Our first exciting monthly installment (Parts 1 & 2, July RCSD) was introduction. There we discussed the four elements of dynamic soaring:

- The punch through a shear layer into oncoming wind, that bumps airspeed.
- The turn across oncoming wind that converts airspeed to groundspeed.
- The "belly to the wind" that gives the glider a downwind drift velocity component, in addition to its speed across the wind, and,
- The completion of the turn downwind, that aligns the downwind drift velocity with the airspeed, for a whopping increase in groundspeed.

We also looked at DS history, from pterodons and flying fish to Lord Rayleigh's 1883 observations of birds gaining altitude from gusts, to Kyle Paulson's 302 mph DS speed record.

Last month (Installment Two, Parts 3 – 6, August RCSD) we did the arithmetic of how a glider DSing picks up twice the velocity of the oncoming wind, per half-circle, less drag and trig effects. (Also, less sink to the outside of the DS circle. Alternately, we saw how, at each penetration of a shear, a glider will pick up the difference between lower and upper wind speeds (less trig effects) as airspeed.

Then we looked at how centripetal lift forces that *don't* increase airspeed *do* accelerate a glider in relation to the ground!

We looked at trig effects—jumps in airspeed are lessened by angles of entry theta (θ) into oncoming wind. Finally we looked at how DS speed increases are fairly elastic collisions with oncoming air, similar to a ping-pong ball's speed increases during elastic collisions with opponents' paddles.

Next month *(Installment four of three, Part 9: "How a glider's speed sink curve limits DS acceleration.")* A decade ago, Joe Wurts observed that sink to the outside of the DS circle limits speed gains. This sink narrows the angle between centripetal lift force and ground path, reducing the component of lift force parallel to ground path, and thus lessening groundspeed increases. This installment will be a correction to *Part 4, DS Forces.*

The author DSing the thermal convergence zone above a ridge with thermal lift on both sides. Even an intermediate model pilot or full-scale glider can DS this airscape. See part five, August issue. Photo by Michael Daily

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Part 7, More ways to DS more airscapes. Where vertical circles will work. DSing dust devils. And (blissful!) circles through the converging thermal airflows from both sides of a ridge

The photo at the beginning of this article is your author DSing the converging, very light airflows above a sharp ridge. At the time, however, I didn't know enough about DS to know for sure that's what I was doing, or just why it was working. And, unfortunately, that's too common. Most RC people I talk to have misplaced notions. It isn't necessary to understand DS to do it.

Understanding DS allows us to identify more ways to DS more airscapes, and to fly them better. To those who have read the two previous installments, the following descriptions, of alternate DS airscapes, will make sense:

Vertical circles are good for beginners. They do work, but usually not optimally. Vertical circle exception: vertical shears

Joe Wurts and other DS pioneers rapidly found that vertical DS circles don't work as well as more horizontal circles. The upper penetration of the shear layer is usually at a poor angle, θ. But! Vertical circles are easy, slower, and a great way for intermediate pilots to get a feel for DS speed gains. See Figure 7-4.

Vertical circles are optimal around a vertical wind shear, as where wind whistles around a grain elevator or vertical cliff corner. See Figure 7-1.

Vertical circle exception two: DSing dust devils?

Opportunities to launch into dust devils are rare. But one can be mentally prepared.

When intrepid slope explorer Chris Erikson flew his Herring into dust devils rolling up the corner of Quartz Mountain, WA, he flew them like thermals. He entered counter-spin, and cored up. Entering

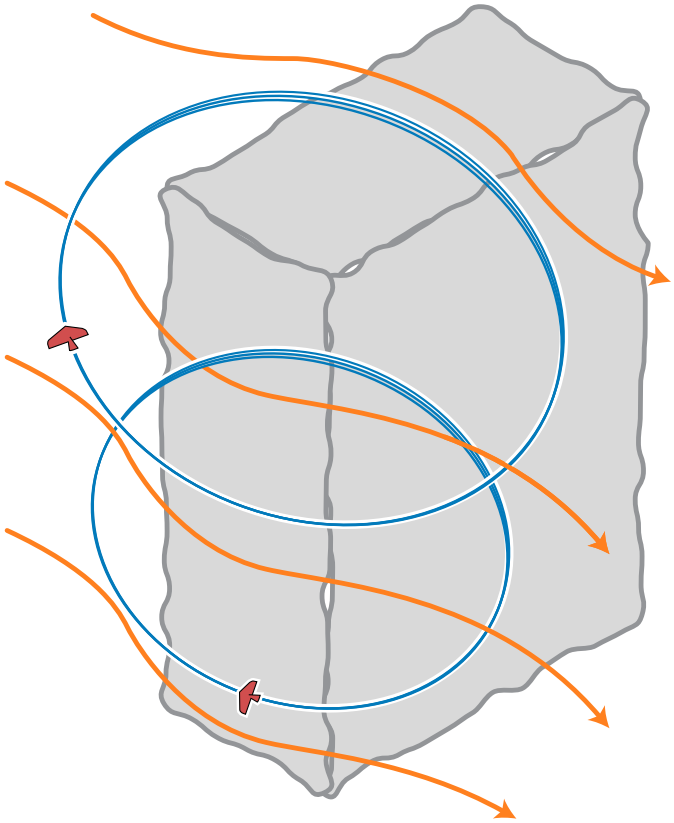


Figure 7-1. DSable shears and rotors form behind vertical surfaces—rocks, cliff corners, grain elevators. Yeah, so this looks like my old PC. Caution: Don't DS apartment complexes. Don't endanger persons! Graphics by Alex Hart

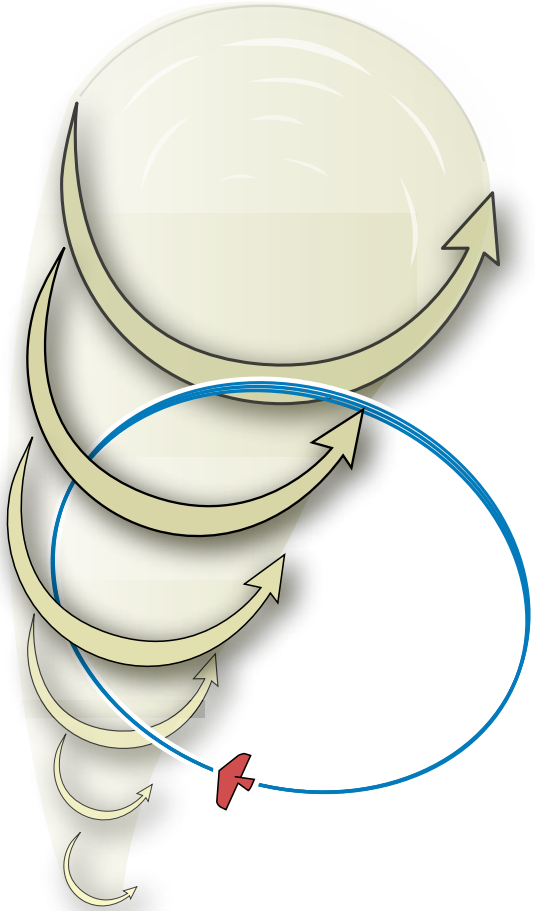


Figure 7-2.
DS a dust-devil!
Graphics by Alex Hart

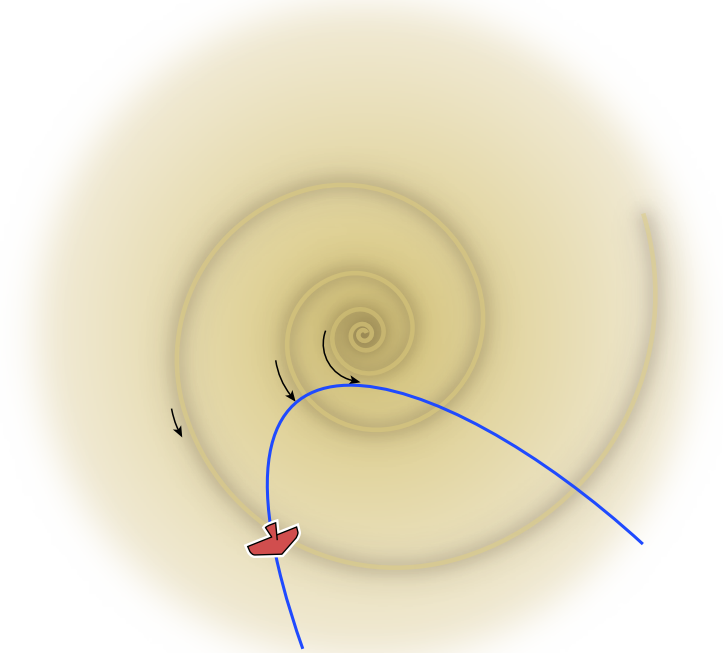


Figure 7-3. A horizontal DS speed bump from a dust devil. Graphics by Alex Hart

against the spin gave him a bump in airspeed, the first part of dynamic soaring. Corkscrewing upwards turns that airspeed into elevation. But coring the dust devil against its rotation means diminishing groundspeed. On exiting into the surrounding air, airspeed and groundspeed will be about the same. That's not DS. It's possible to do better.

DSing dust devils? Entering against the spin and making a half-loop upward *within* the oncoming air should work. See Figure 7-2. The tightness of the pitch upwards will require something like a Red Herring (Liftworx.com). Bigger, faster planes may punch right through, experiencing a turbulence bump rather than DS.

Horizontal circles, that is, making the turn outward within the oncoming air, should also add some groundspeed. See Figure 7-3.

Frontside DS with ridge lift

Frontside ledges or steps can have the shears or rotors necessary for DS, plus slope lift. See Figure 7-4.

It's also possible to DS the shear layer upwind of a ridge. Often there is relatively slow air below where one finds slope lift. For phenomenal graphics of full-scale gliders flying a serpentine path in this situation, see:

http://www.lfm.mw.tu-muenchen.de/lfm_sources/albatros.html

DSing downdraft sink, updrafts, and thermal feeders

Taras K. has a dramatic article on Jo Grini's DS website, http://www.grini.no/ds. Taras explains how a glider can extract energy from sink, down-gusts, or from side or upwards gusts. Here's my take:

Air often flows in well-defined streams, up, down, or sideways. Often one only knows where the stream is by hitting it, when it's too late to transit the shear layer at an advantageous angle, θ, shown as point 1 in Figure 7-5. But the glider may still be able to exit the stream at an airspeed boosting angle, as in point 3 in Figure 7-5.

And there are many ways to know where thermals, down or up, are. Often after a "bump," full-scale glider pilots will count seconds while turning back, to estimate where the thermal is. They may observe birds or other gliders. They'll watch for

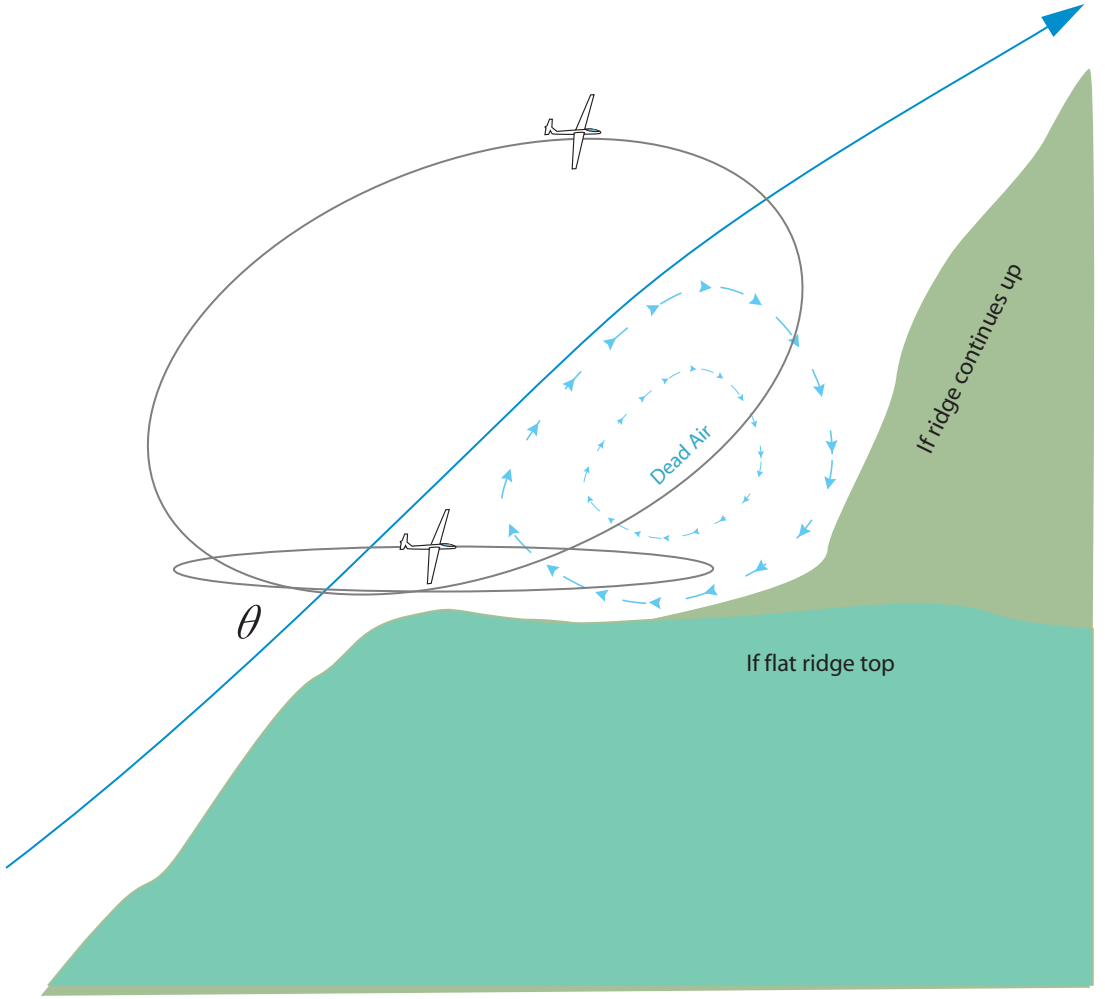


Figure 7-4. Frontside vertical and horizontal DS circles are helped by ridge lift. These take less fear to start than the backside DS plunge. Recently I showed CEWAMS RC pilot Mike Daily vertical, front-side DS circles, on a flat ridge top, in medium air. He was instantly better at it than I. He said, "You can really see the speed increase." Note that in the vertical circle, the upper shear transition angle usually won't make an airspeed increase. Graphics by Philip Randolph

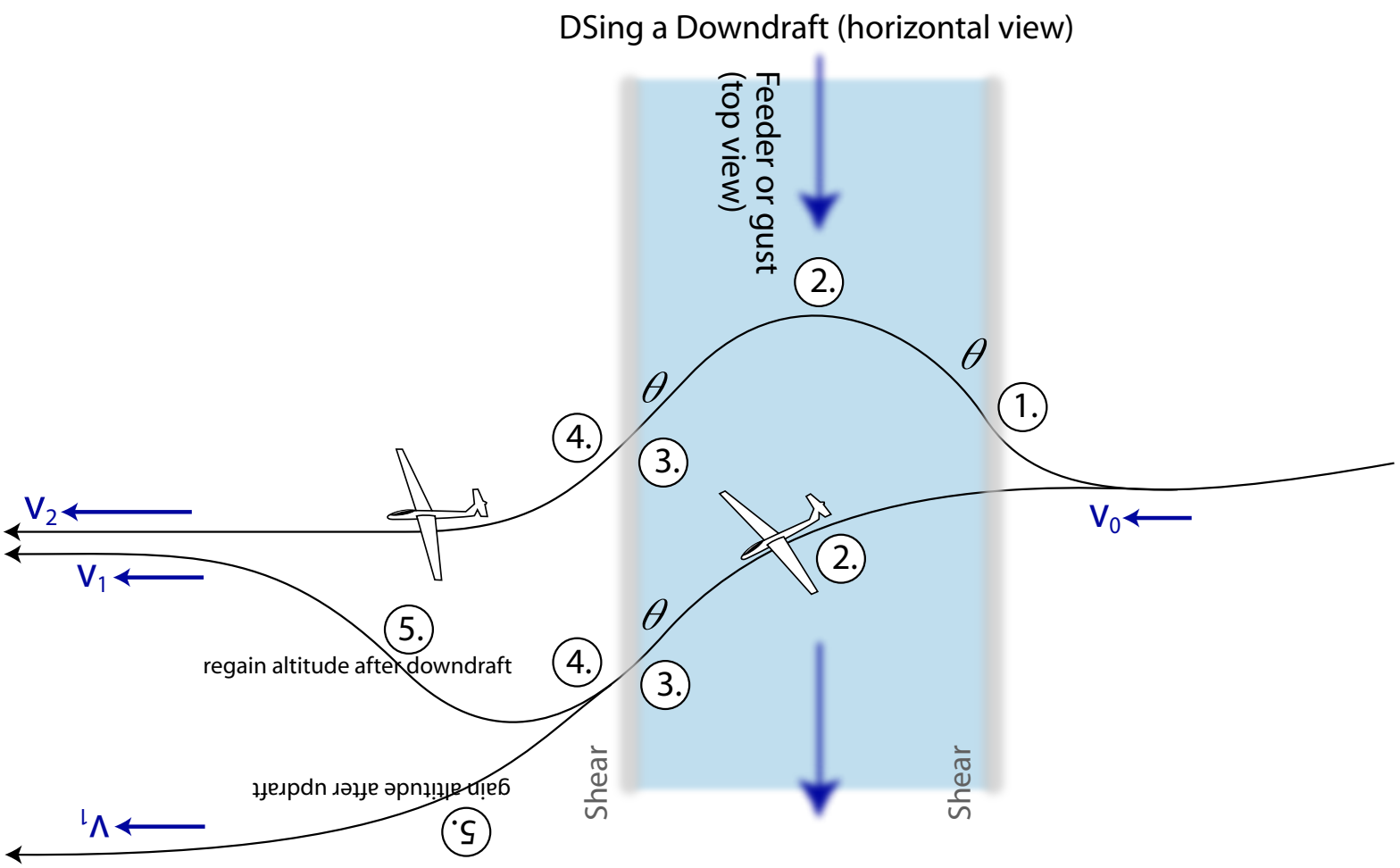


Figure 7-5 DSing a downdraft (side view), updraft (inverted view), gust, or horizontal feeder (top view): 1. Increase in airspeed from the turn upwind across the shear layer, only possible when one knows where that is. 2. The turn downwind. 3. Increase of airspeed on penetration of second shear layer. 4. The turn to convert gained airspeed to a desired direction. 5. Regaining altitude. Graphics by Alex Hart

the lenticular (lentil shaped) cap clouds that often form above thermals. They may even keep track of local air currents using GPS.

Model pilots add a variety of clues: The behavior of our gliders. The cool, feeder breeze on the back of one's neck that lets them know a thermal is ahead. Watching tufts of cottonwood down. Even blowing soap bubbles into the air.

If a model or full-scale glider pilot observes another glider coring a thermal, he might dive beneath it and pull up, exiting with added velocity he can trade for elevation.

In an "Air and Space" article, the pilot of the "Carbon Dragon" talked of DSing in and out of horizontal "feeders," air streams at considerable altitude, which flow between thermal updrafts and downdrafts.[1] I keep wondering if a U2 pilot could play similar games with the jet stream.

Circles around a conical peak with centripetally converging thermal flows are just slope lift. But there is a way to DS such peaks. Marbles

Remember, if there isn't a turn across (or up, down) an airflow, it isn't DS.

A glider circling in convergent thermal up-flows above a round hill does experience centripetal lift forces. But there aren't DS increases in speed from penetrating shear layers. So these speed jumps don't happen, and the glider doesn't convert them to groundspeed by turning in relation to the wind—it's always moving across the wind. Circling in such flows is just ridge lift. See Figure 7-6.

Still, model and full-scale pilots, with caution, should be able to DS such flows, by cutting right across the top of the hill into opposing air. See Figure 7-6.

We can simulate thermal slope lift of circling such a peak, with our marble and our pot, by moving our pot in a circle. The centripetal forces on our marble will be much like the centripetal lift forces on our glider. Boring. See figure 7-7. It is possible to move the pot in circles, such that its motion is always shearing opposite to that of the marble, which gets zipping. We can't do that with a model—which above such a hill only gets belly-to-the-wind, ridge lift.

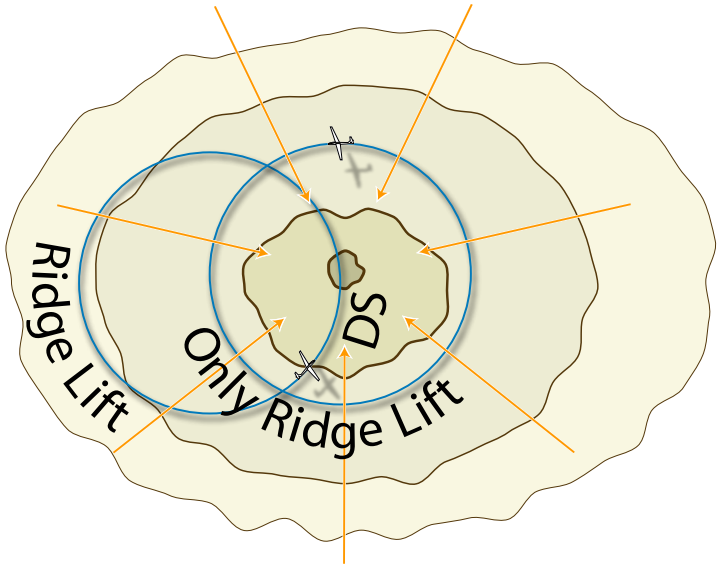


Figure 7-6. DS thermal convergence above a conical hill. The DS circle shows getting one speed bump per orbit from the difference in opposing airflows, the turn across airflows, and also some slope lift! A similar strategy could be used to DS the lower, converging flows of thermal vortices. Graphics by Alex Hart

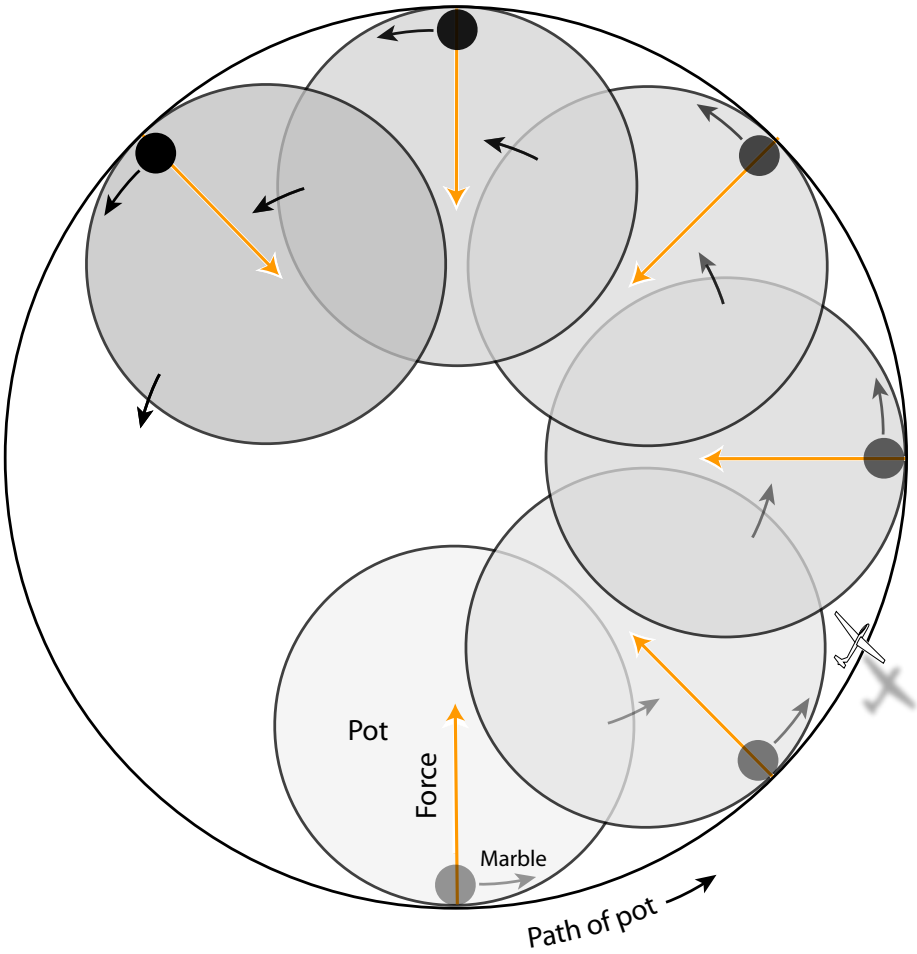


Figure 7-7. Simulation of slope lift around a peak, with a marble in a pot. Picture orange arrows both as centripetal force on the marble, and as converging thermal flows above a round peak. There aren't penetrations of shear layers, nor turns in relation to the wind, so it isn't DS. Graphics by Alex Hart

DSing "thermal vortex rings"

The following also applies to getting energy out of the converging flows near the base of a thermal, or the diverging flows near its head.

Taras K. also discusses flying "thermal vortex rings," like smoke rings puffing vertically. They have converging flows near their base, and diverging flows above. He describes getting extra energy from flying a circle through the lower, converging flows. That's like flying the converging flows around a conical peak. It doesn't have the bump in airspeed from hitting a gust or penetrating a shear layer, the turn that converts that new airspeed to groundspeed, or the finish of the turn that adds wind-speed to newly acquired airspeed. It's just circular ridge lift, not DS. See Figure 7-6.

But: in the converging flows low in a thermal vortex ring, the pattern for DSing a conical peak with convergent flows should work. Again, Figure 7-6.

Further up, the outflow of a thermal vortex ring could be DSed like charging into the airflow above a hill, turning, and exiting. The shear layer of the oncoming air will be below the pilot, rather than above. But the strategy is to gain airspeed charging through that shear into outflow, turn belly-to-wind within the outflow, and complete the 180° turn, to add outflow speed to newly bumped airspeed, for a whopping groundspeed exit.

This DS pattern should look like Figure 7-3, if you imagine a radiating, outward flow, rather than the dust-devil's circular flow.

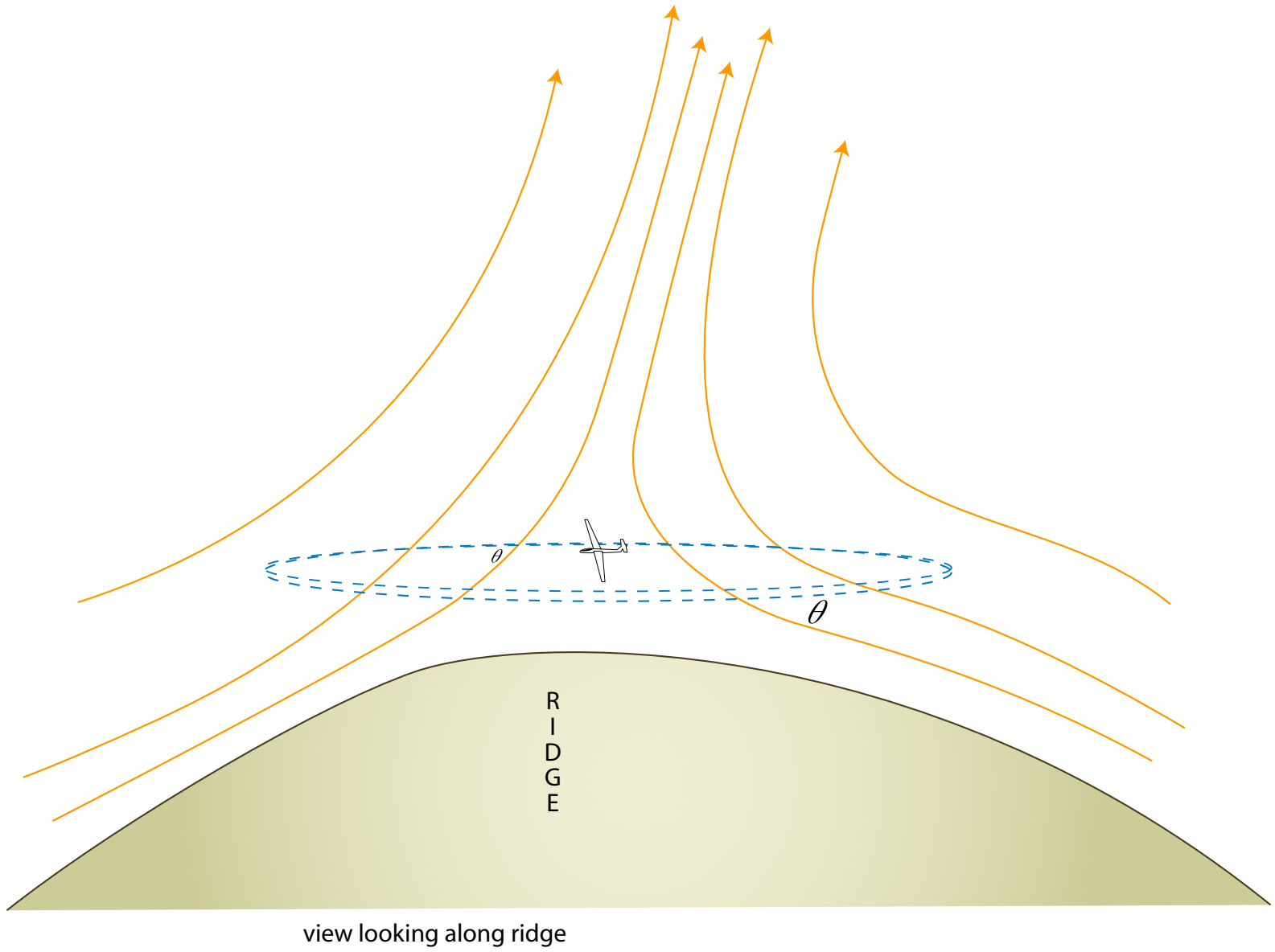


Figure 7-8. The easiest full-scale or model dynamic soaring is in converging airflows above a ridge. Graphics by Alex Hart

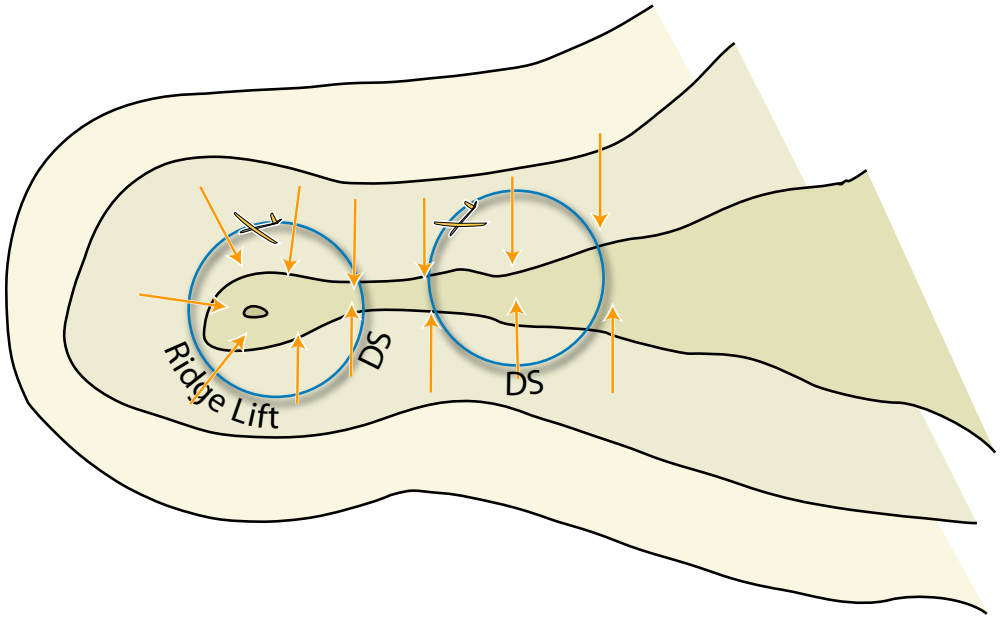


Figure 7-9. A contour map of the ridge in the photo. DS requires a turn across airflows. So DS was only by crossing the ridge and turning. Circling the bump at the end of the ridge was a mix of slope lift and DS. Graphics by Alex Hart

The easiest dynamic soaring: Where warm air wicks up both sides of a ridge—slow DS plus thermal lift

Intermediate flyers with light slope planes, here's an example of a kind of dynamic soaring you can do. It won't set speed records, but it's a delight.

Late one summer, southwest of Mt. Rainier, WA, CEWAMS (Chris Erikson's Wild Arsed Mountain Slopers) camped on a narrow ridge surrounded by a huge, steep talus field. Its basalt had warmed all day in the sun. So near sunset, thermal lift was coming up both sides of the ridge. But the lift was so light not even the EPP Herrings were doing very well.

The only hand launch glider (HLG) we had along was my 40", "underhand launch," polyhedral Ionosphere, from Thermal Grommet Works. It floated around quite happily, till I started flying circles over the ridge. Then, even in that light air, it started whipping. The other guys stopped trying to fly, and just lined up to watch and take pictures. A balmy evening, Mt. Rainier ten miles away, the sun setting just to its south, probably the most blissful flying I've done.

In search of this is why we fly where we fly.

I had a vague notion that I might be doing something sort of like dynamic soaring. In retrospect, yes: My ionosphere, in addition to having a little thermal lift, was punching back and forth between opposing air streams, gaining the difference in their velocities twice per circle. And it was also getting slope lift! See Figures 7-8 and 7-9.

Full-scale gliders do get DS lift by serpentine patterns along ridges with wind shears. They should also be able to do a serpentine DS along a ridge with a convergent thermal flows.

θ or S or ~ Part 8, Dynamic soaring dynamic seascapes: Northern fulmars and petrels DS the rotors behind waves, rather than just the gradient of horizontal wind velocities in the shear layer above water.

Now that even newcomers have a basic understanding of dynamic soaring, it's time for some conjecture about how a couple seabirds play with the air currents around waves. When there is energy to be had from air currents, flying things have learned how to take advantage of it.

An astute observer

A few years ago, Jim Pearson worked as an observer on trawlers and processors, in the Bering Sea. As a discus-launch glider competitor, Jim was practiced at observing how air currents and flugel things interact, and was familiar with model-glider dynamic soaring, if not yet with DS theory. So he knew what he was seeing when he watched fulmars and petrels dynamic soar waves.

He says, "They go anywhere they want without flapping their wings even once, and they make albatross look slow. They'd take advantage of the smallest

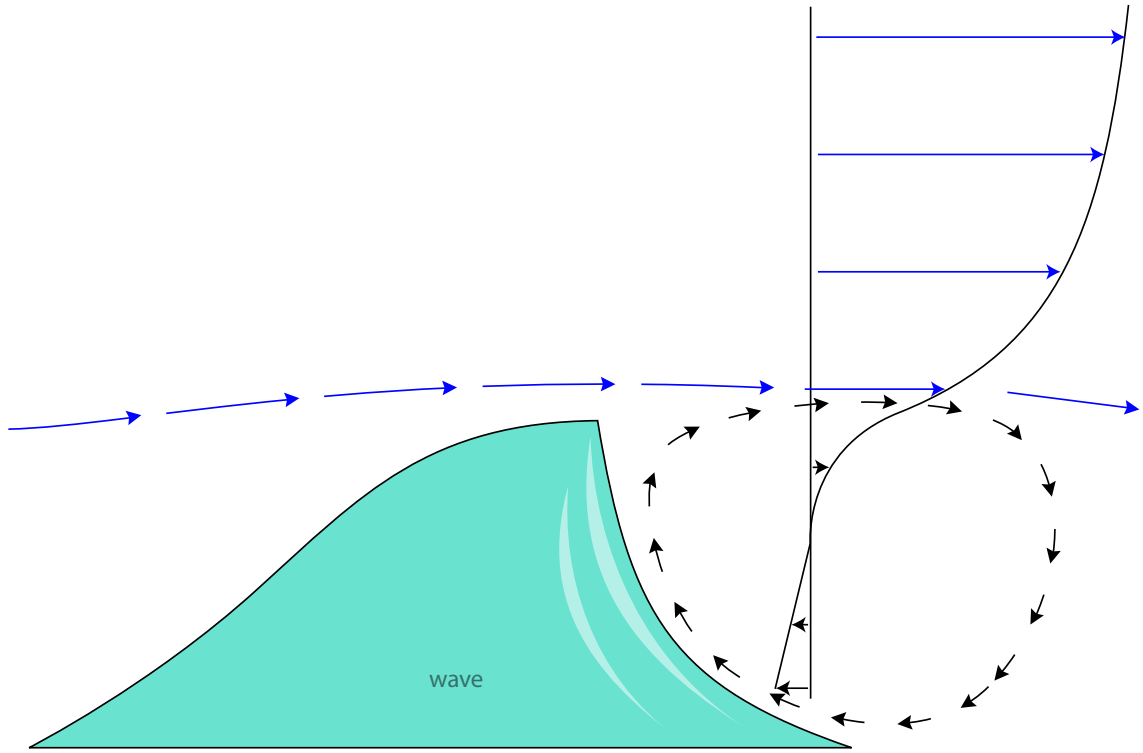


Figure 8-1. The variety of airflow patterns around waves is nearly as great as those around hills. However, waves have more constraint on shape than solids. Also, wind-waves always form at right-angles to the wind, ideal for both frontside lift and rotor formation. Winds at all angles to wave crests do happen. Graphics by Alex Hart

air currents around waves or boats, or surf the air around huge storm waves. They'd dive down into the slow air in the troughs of waves, usually flying across the wind, gain energy, and soar up to nearly a standstill, sometimes progressing from wave to wave. I kept trying to figure out just what they were doing, and how."

Great observation. It expands the question of birds' DS repertoire.

In fact, Jim was such an avid observer that when a fulmar would ride the uplift next to the ship, he'd reach out, grab a wing, and haul it in. He says, "I'd measure their wingspans and weigh them while they squawked and threw up all over my foul-weather gear."

Conjecture about patterns

Jim says, "It has been a few years, so the mental video playback button is a little rusty." The following is partly from Jim's descriptions, and from what Phil Pearson understood him to say a few years ago.

So given lack of ironclad evidence, allow me to conjecture: The principles of DS are the same for all. Model gliders use air currents over static waves called hills. Fulmars and petrels DS moving hills. See Figure 8-1.

Design considerations: Wingspan, or speed and agility?

At fractionally subsonic speeds, and within structural constraints, almost anything flies more efficiently with a longer wingspan.

A large part of drag is from wingtip vortices. That "lift" or "induced" or "vortex" drag is what is minimized by large wingspans, or light span loadings.

But! Speed can partially make up for wingspan. Shorter wingspans can handle higher gee forces, and are thus better for taking advantage of the violent currents around large waves in high winds.

And, at higher speeds, wingtip vortex losses become a smaller portion of drag. So fulmars and petrels compensate for being smaller than albatross with speed, and also with the agility to play with air currents close to waves. Jim says, "They'll often drag a wingtip."

Dragging wingtips may be to prevent wingtip vortex formation, or because "shear driven cavity rotor" velocities are highest near the constraining "cavity" surface. (See Installment One, Part 1.)

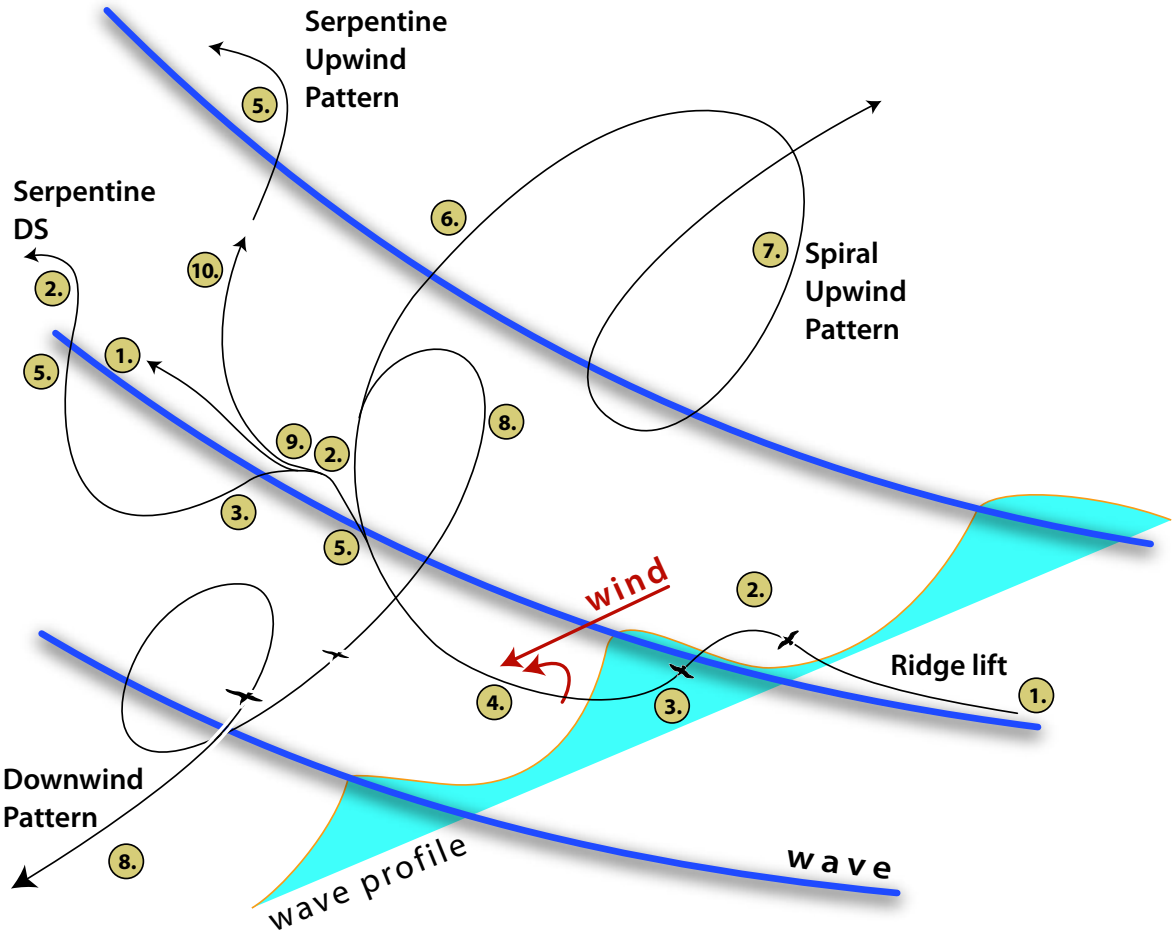
Birds will often choose DS patterns that are gentler than those required for maximum extraction of energy from air, and thus have more choice of DS pattern

But a bird's objective isn't the same as that of speed-record oriented model glider pilots. Every flying thing has a VNE, "Velocity Not to Exceed," based on the maximum wing loading it can experience at various speeds, and on its structural capabilities. For gliding birds this is especially critical in a "wings open and locked" planform--birds are generally trying *not* to get going so fast their wings may blow apart in mid air. Barnes reports that Albatross will do three gee turns, which is low compared to model DS turns. Even smaller birds probably try to stay away from the extreme gee forces, in turns and turbulence, that sometimes break a model's carbon spar.

So a bird's objective is to get enough energy from air currents to go where it wants, but not so much as to endanger itself. Around big waves and high winds, it will find more energy than it wants to use. Consequently, it won't follow the patterns of flight designed to extract maximum energy from the air. That gives it a lot of flexibility in what it does.

Around high winds and big waves, it will pick patterns that are softer than those of DSing models. It may choose not to punch up through the violent shear trailing the crest of the wave. Or, when penetrating up over a wave it may choose not to punch straight into the teeth of the wind, avoiding the maximum bump in airspeed. It may take a softer angle. It may even take most of its airspeed increase from the dive somewhat downwind across the top of a wave into the slower air in the wave's lee. See Figure 8-2.

Figure 8-2. A few potential elements of bird, ocean-wave dynamic soaring patterns:
1. Horizontal run in trough with “ridge lift” upwind of wave
2. Turn downwind to add windspeed to groundspeed.
3. Dive downwind of crest, through shear, into slower air to convert groundspeed to airspeed. Turn to convert airspeed to groundspeed.
4. Horizontal run in trough, in protected air.
5. Punch up over crest, through shear, into oncoming wind to gain airspeed. Then:
    6. Climb to convert airspeed into elevation.
        7. Dive to DS next wave. (Upwind pattern, corkscrew, figure eight, or diagonal.) Or:
        8. Turn downwind to add windspeed to airspeed. Coast till DS of another wave. (Downwind, “faster than the wind” pattern.)
    Or:
    9: Turn to convert airspeed to groundspeed and dive down into trough, and:
        1. Repeat 1 (run in trough upwind of crest). Or:
        10. Serpentine pattern progressing upwind from wave to wave: Diagonal in calm of trough to punch up over next wave (5.).
7. Upwind patterns.
8. Downwind patterns
2.-3.-5.-2.-3.-5.-2.: Single wave, serpentine pattern follows middle wave.
Graphics by Alex Hart



Petrels and fulmars make model dynamic soaring look static

A non-DS wave pattern. One more astute observer

Sanders Chai is an avid RC glider pilot. In Florida, he observed pelicans riding the ridge lift in front of waves. He said, "The air was calm. The big ocean waves must have pushed air upwards, ahead of them, as they rolled toward the beach. The pelicans would drift just in front of the waves, riding that ridge lift."
It's a case of the hill moving in relation to the air, simple relativity.

DS Patterns around waves

One DS pattern I suspect fulmars and petrels use looks quite like the most usual model glider DS pattern, a circle behind a hill, except that at their highest point a wave passes under them, so they dive on the next wave. If their progress were upwind, their pattern might look like the spring on a spiral bound notebook. (Spiral Upwind Pattern.) If they want to quarter into the wind, they probably use a serpentine pattern rather than spiraled circles. (Not shown.) Another pattern would be to slide up over a wave into oncoming wind for airspeed, turn to make airspeed into "groundspeed" parallel to the waves, dive into the trough out of the oncoming wind, diagonal to windward, and repeat. (Serpentine Upwind Pattern.)

On a broad reach (quartering downwind), the fulmar may take advantage of ridge lift upwind of waves. That's not DS. But if it turns at least partly downwind to add windspeed to airspeed for added "groundspeed," and dives into the slower or retrograde, rotor air behind a wave, it gains airspeed. With that airspeed it can run in the trough for a ways, and then pop up to repeat its pattern. That's close to what Jim described.

Or, after a run in a trough, it may turn to diagonal up the downwind side of a wave, into the wind, gaining airspeed it may trade for elevation.

Jim says, "Petrels and fulmars make model dynamic soaring look static."

Request for video footage!

Your author is networking his fishing contacts to get videos of birds DSing waves. Reader, if you are where you can film such, please do contact me: amphioxus,philip<at>gmail,com. Video credits given if used, of course.

Acknowledgments:

Thanks to Alex Hart Design Media Group, Inc. for graphics from my crude sketches, and for getting me going on Adobe Illustrator. Normally Alex designs interactive web pages for multiple unit apartment rentals. E-mail to alex<at>ahdmginc.com.

Thanks to Dr. Steven Allmaras, Boeing, for setting me straight about shear driven cavity flows and other fluid dynamics. ■

A *Have Sailplane — Will Travel* Footnote

The Easy Rider

Tom Nagel, tomnagel@iwaynet.com

One neat thing about the Easy Rider is that with a couple of simple modifications, you can make it fit back into the box it came in, for automobile vacation travel purposes.

Here is what you do:

1. Use the bubble wrap the wings came wrapped in to make two wing jackets. Turns out there is plenty of bubble wrap to make two jackets.

2. Cut a circular hole in one of the ends of the box, about 2” in diameter. This lets the nose of the fuse stick out far enough that you can stow the fuse upside down in the box, with the bagged wings one on each side.

3. Use a scrap of Coroplast, a wooden dowel, and some duct tape to fabricate a protective bumper for the horizontal tail surfaces. The photo shows what I am talking about. The tail protection system worked well for me on this year’s family vacation.

I found there was room left over in the Easy Glider box for my transmitter, Apache lipo charger, Sirius transmitter charger, a few small tools and a roll of clear packing tape. I also keep a little wire hook in the box to help me thread the aileron leads through the fuse.

Ready to pack for an outing. Use the bubble wrap the wings came wrapped in to make two wing jackets. Turns out there is plenty of bubble wrap to make two jackets.

Above: Cut a circular hole in one of the ends of the box, about 2” in diameter. This lets the nose of the fuse stick out far enough that you can stow the fuse upside down in the box, with the bagged wings one on each side.

Upper right: Use a scrap of Coroplast, a wooden dowel, and some duct tape to fabricate a protective bumper for the horizontal tail surfaces.

Right: Spinner in cutout, tail protected, wings either side of fuselage, and a strap for security. Ready to go just about anywhere there’s an opportunity to fly!

A restoration project

Bill Evans' Saracen

Tom Nagel, tomnagel@iwaynet.net

A new contest: TWOFSIC-- The World's Oldest Flying Sloper In Captivity

In February I went to an RC swap shop run by the Licking County, Ohio, RC club and picked up a Bill Evans 72" Saracen, with a battery and two servos for $5. It was built probably 30 years ago by club member Don Harris, who you may have heard about as a three-time LSF-V. Don eventually traded it to the late Dick Kinser of Newark OH, who had more RC toys than God or even Captain Jack Strother.

The Saracen was being sold at the swap shop for Dick Kinser's family by Clarence Hauk, one of the founders of the Licking County RC Club. Since the Saracen was damaged, and a sailplane, I was just about the only one interested, so I got a heck of a deal. Clarence didn't want to haul it home again, and Don Harris had already built it once, and didn't need to do it again.

To me, however, the Saracen was an heirloom item: one of the first popular RC flying wings, a model built in the late 1970's by Don Harris, who had helped me learn how to fly with success, and crashed by Dick Kinser, who had showed me how to crash with style. If I could get it back in the air, it would be a slope flying classic, possibly the oldest sloper in captivity. Best of all, Don Harris' CG pencil marks were still on the bottom of the wing! There would be no need to laboriously re-trim the model.

Dick Kinser was known for his trademark maneuver, the Kinser Landing, which involved typically a lot of cartwheeling and splintering of wood. Technology caught up with him and brought him EPP, and he is reputed to have died happy. I went to the funeral, and I can't tell you for sure that he died happy, but there was a small RC plane in the casket with him.

Because of the Kinser Landing, this Saracen came to me with a little damage to the left wing, and no hatch cover. I made a new hatch cover right away, and the wing went into the recovery room, and I expected it to be recovered in a few days.

I decided to leave the sliding tray mixer in place. The tray moves forward as the elevons come up, so the effect on the CG should be minimal

The repair process:

Dick Kinser had stripped most of the Solarcote covering off the damaged outer left hand panel, top and bottom, and had filled in the damaged foam with some sort of light spackle. The spackle was heavily gooped in with a mountainous surface. The first thing I did was take a carbide T-bar sander, and sand it smooth, following the contours of the original foam wing core as best I could.

Dick had started repair on the leading edge and trailing edge damage, too. I removed more loose Solarcote covering and cut out pieces of 1/16" sheet to splice into the gaps. I sanded the underlying wood so that the new sheeting lay flat and followed the contours of the rest of the wing. There was leading edge damage top and bottom, but only topside damage on the trailing edge. The left hand elevon was undamaged, but all of the plastic hinges had popped loose. I removed the left elevon to make repair and recovering easier.

I used Gorilla Glue to bond the balsa wood splices to the foam wing cores and to the other balsa. This gave me plenty of working time to get the pieces properly aligned, and also meant I did not need to repeatedly mix small batches of epoxy. I used masking tape to get the spliced in balsa to wrap and curve as needed and an assortment of lead and steel weights to hold the flat parts down while the Gorilla Glue dried.

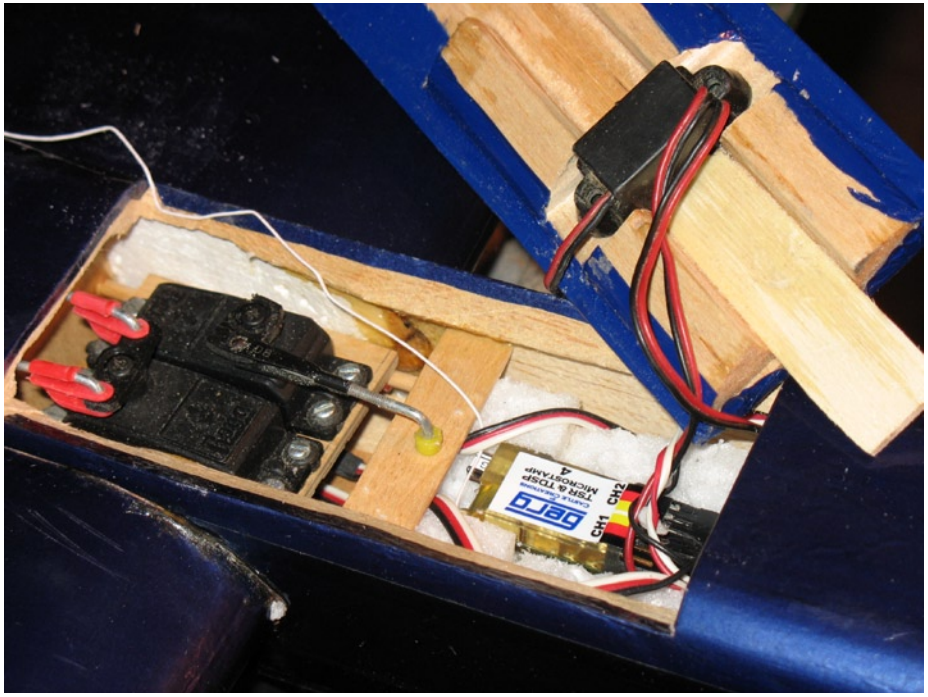
The Saracen has thin strips of wood glued to the top and bottom of the Styrofoam wing cores, spaced about three inches apart, sort of like rip caps. Several of these had apparently been destroyed in the crash, so after I got the core smoothed out and the LE and TE repaired, I replaced the missing strips.

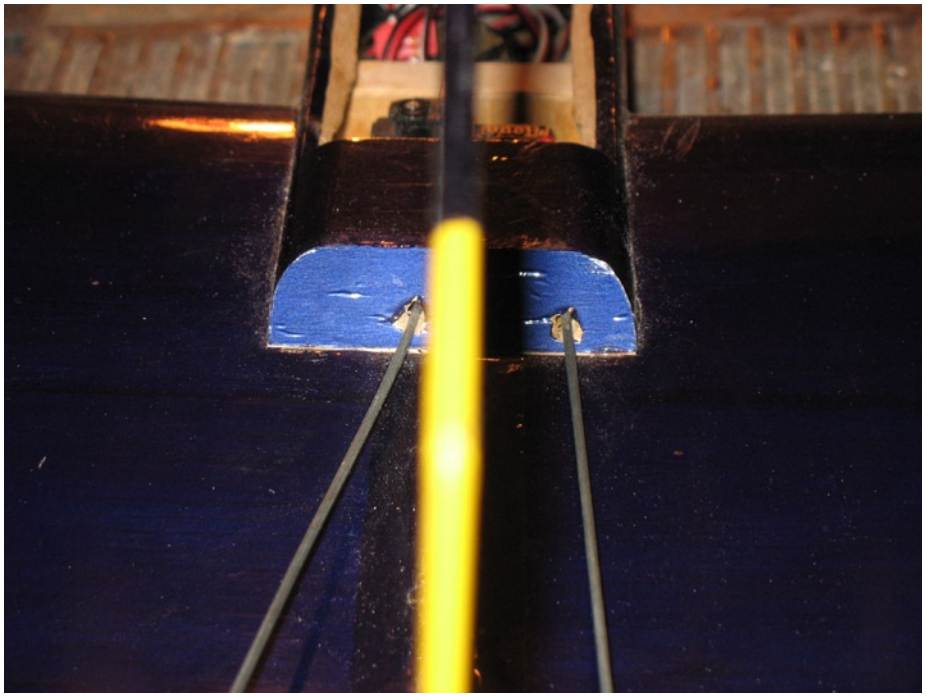
I started checking around for Solarcote, hoping to match the purplish-blue covering for the fuselage hatch cover and the bottom of the wing. I had no luck at this, and finally refinished the bottom of the wing with some German brand of low temperature covering that I had appropriately won at a Licking County RC Club electric fly-in. It was the closest match I could find. The yellow wing tip covering was easily matched with Monokote that I had on hand.

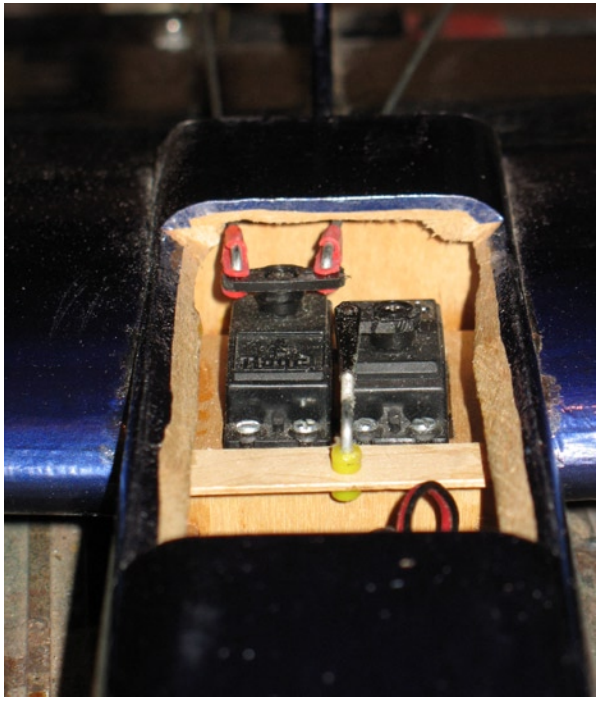
I temporarily put the elevon back in place and checked the CG. It looked like I might need a couple of ounces of lead in addition to the receiver and battery to get the Saracen to balance on the mark. The Saracen's CG is only 1.74" back from the leading edge. Ultimately I decided to get rid of the old flat four cell pack that had come with the plane. The inscriptions were faded, but seemed to indicate the pack dated from some time in the Reagan administration. I bought a NiMH square pack, which was a little heavier and could be tucked further forward in the nose. Less lead, more power, same CG.

The new Berg 4-channel receiver seemed lost in the fuselage. I cut a piece of EPP foam to keep the battery and lead up in the front and cushion the receiver amidships. I couldn't see where Don Harris had routed the antenna. I finally ran the wire up the front of the vertical fin and left about a 18" trailing behind.

And in my wife's sewing box I found a couple of glue-on eyeballs, just right for the bird head Don had carved on the fuselage. All I had to do was add a black line on the beak for the mouth. (This brought the total of bird or bug themed planes in my collection to three, including the Infamous Flamingoid and the Anatomically Correct GWS Lady Bug.)







Next step: test the old servos and sliding tray mixer. They worked perfectly. Note in the photos how the pushrods exiting the fuselage are not symmetrical because of the way the sliding tray linkage works.

I cleaned up the covering with Goo Gone and glued the elevon back on with Gorilla Glue. Normally I use tape hinges on my planes, but in this case I reinstalled the plastic hinges with wire hinge pins that Don Harris had originally used. I thought I was done.

The next day when I looked things over I noted that the wing repairs had resulted in a somewhat larger gap between the elevon and the main wing on the repaired side. And I noticed that the repaired wing flexed a little about two-thirds of the way out from the root. The Monokote was wrinkling where the leading edge was spliced. About that same time OFB Phil Pepin sent me a set of color photocopies of the original “How to Build It” article on the Saracen by Bill Evans from the April 1976 issue of Radio Control Modeler. (Phil apparently never throws anything away.) Looking carefully at that article two things became immediately apparent to me:

1. The Saracen had no wing spar. It is just a foam core wing stiffened by balsa sheeting laminated onto it for leading and trailing edges. The repaired wing was possibly a little wimpy.

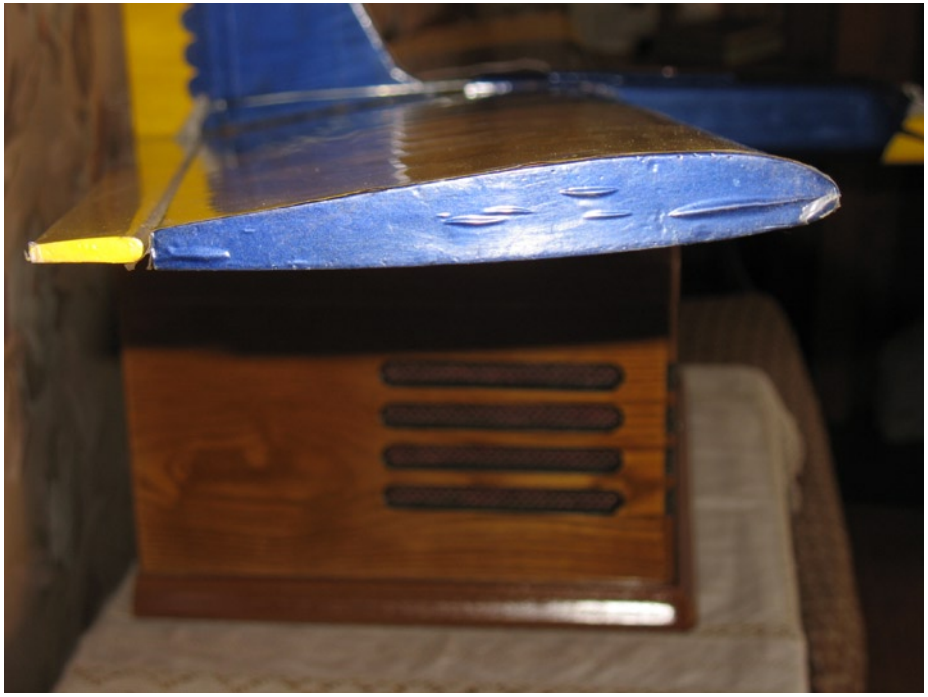
2. The editors of RCM used an awful lot of cheesecake photos back in the 70's. I'd have to make sure my wife didn't see the RCM color copies.

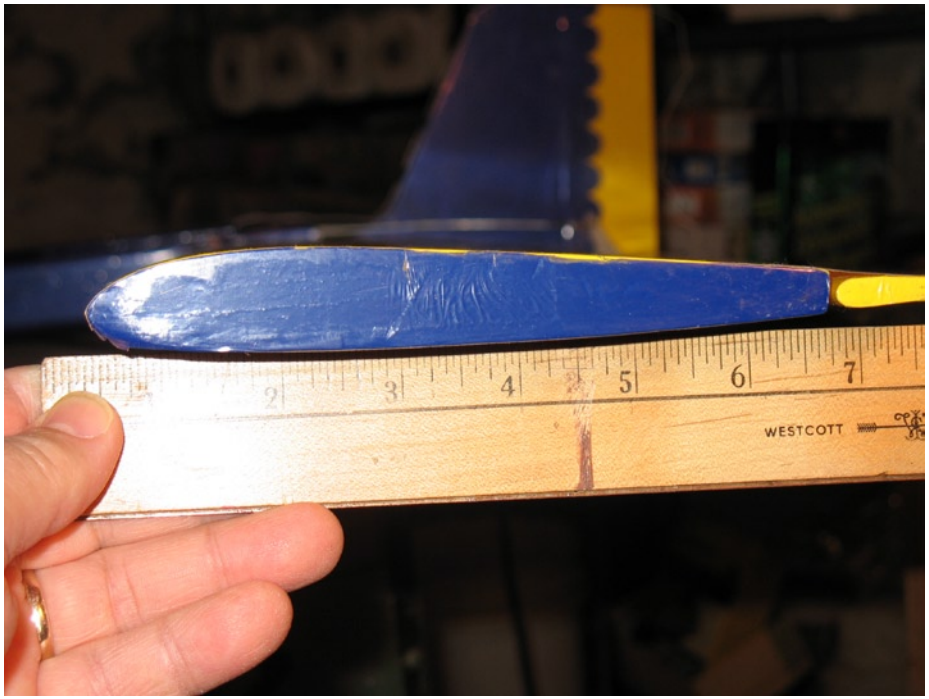
In order to deal with the wimpy wing syndrome I decided to take advantage of the shallow bays between the "rib caps" and using Gorilla Glue again I glued a piece of balsa (grain spanwise) onto the foam core between two of the caps on the top side of the wing. A bag of lead #5 shot held the balsa down against the gently curving wing core. When I recovered the area, the Monokote wrinkling had disappeared, and the wing was significantly stiffer.

The hinge line gap was easier to deal with. I just used the paper shear at work to slice a clear plastic folder cover into 1.75" strips, and with Scotch double sided tape I used the strips to cover the elevon gap on both left and right wings. I don't know for sure the effect of a big gap between the wing and control surface on a flying wing, but at least now it will be symmetrical.

Then the hard part: I had to refrain from flying the Saracen until after the Westerville Model Aviation Society's static show and swap shop in late March. I have a history of winning trophies at that show, mainly because hardly anybody else enters sailplanes. I was going to be fair about it. I made up a placard that said:

The World's Oldest Flying Sloper
in Captivity—a 72" Saracen
Designed by Bill Evans
Built by Don Harris circa 1979
Crashed by Dick Kinser
Rebuilt by Tom H. Nagel
Just give the trophy to the last guy

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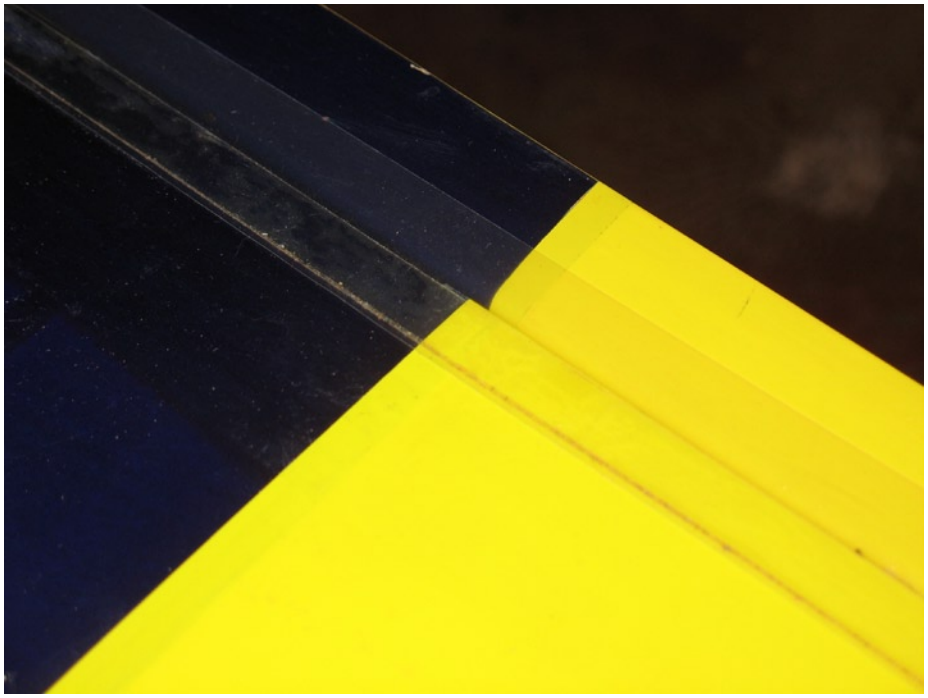
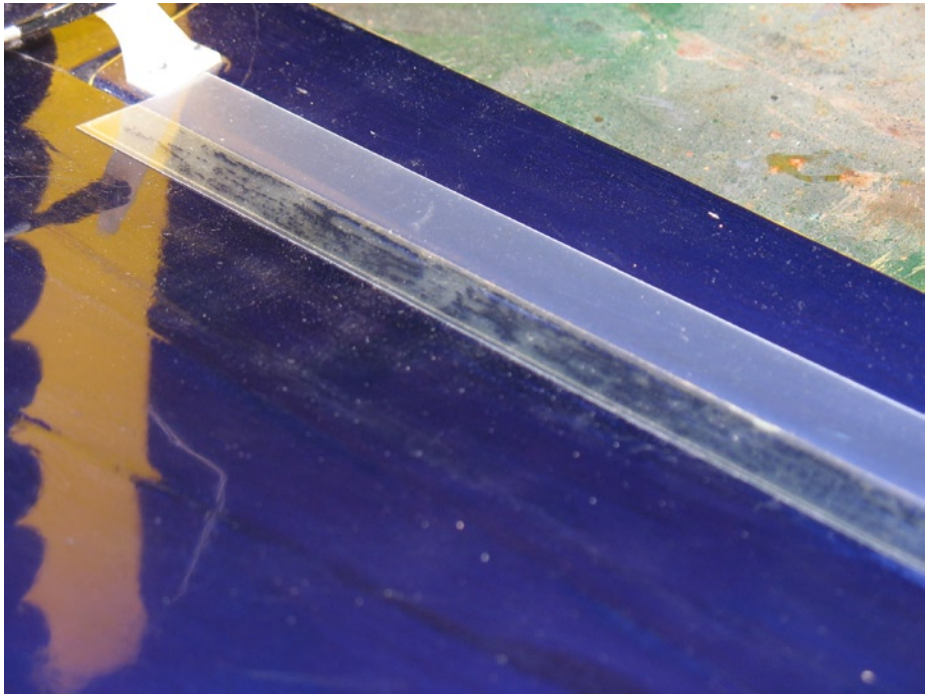
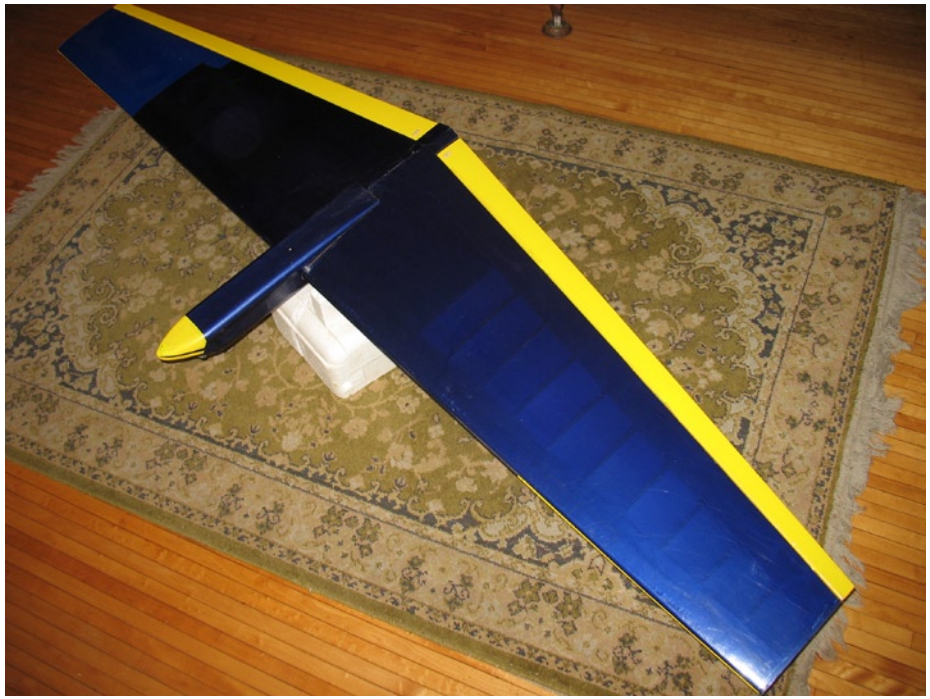
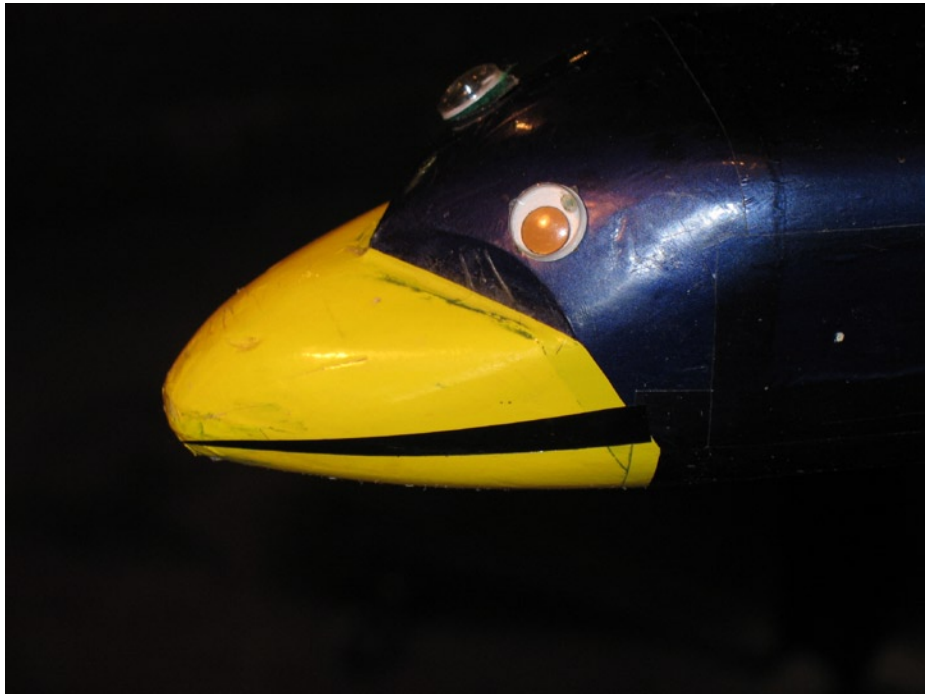








I paid my entry fee and filled out the table card and put the Saracen up for display at the show. I still didn't win, even though there were only two sailplanes on the table. It seems I forgot to sign up on the entry sheet. Bureaucrats.

That got me thinking a little about what else I might have forgotten when I was doing repairs on the Saracen. (I asked my wife, What's-Her-Name, but she didn't know. Old age is hell.)

We had nice weather here for the first time in months the weekend of April 21st, and I got our club's flight surgeon Dr. Greg Bell to heave the Saracen for me on the flat field. As he threw, the vertical cracked off and the plane spiraled to an awkward landing. The aileron servo was reversed. OK, there's a couple of things I forgot to check. That night I re-glued the vertical fin and reversed the servo on my transmitter.

My second attempt at first flight was just about perfect. The Saracen had a smooth, fast glide, and a nicely balanced turn. I cranked down the elevator throw by about half, and I was ready to hit the slope.

Slope weather eluded me until the lucky day of 7/7/07, when winds were forecast out of the southwest at 10 top 15 mph for our Newark, Ohio, slope site. Andy Litsky showed up to help me on the first flights, and we were right back at the same site where Dick Kinser had cartwheeled the Saracen in the first place. The slope lift was spotty and shifty, not at all as good as Buena Vista Street normally is in 10 to 15 mph. Still we got a half dozen short flights, a half a dozen good landings, and a few good pictures.

The Saracen does not fly at all like a Boomerang or a Zagi or a Mongo Jr. or even like a 100" Klingberg Wing. The CG is right on; the glide is great. Turns, not so much. It may take a little more work on the elevon throws to get the Saracen to maneuver the way it should. Right now I am thinking, move the clevis in one notch at the elevons and add some exponential to soften up the center of the throw.

That's for next time out. Right now, I claim the bragging rights to the title: The World's Oldest Flying Sloper in Captivity.

If you've got one older that still takes to the air, enter the TWOFSIC contest by sending me the story and some photos, and your name and address written on the back of a $500 NSP gift certificate.

One more thing. The plastic googly eyes from my wife's sewing kit just were not working out. One of them kept falling off, and finally I lost it on the slope. I made a quick stop at Yankee Trader, our local carnival supply store, and picked out some replacement eyeballs that better suited my flying style.

Here's looking at you! ■

CEWAMS

Chris Erikson's Wild Arsed Mountain Slopers (sans Chris) reconstituted at Table Mountain

Dorks, off-road eco-stompers, ticks, Buffalo Gals and cosmetically augmented personages and Goodwill in a microwave oven.
Plus: Why wind doesn't always make slope lift. What guys talk about, and,
Oh yeah (I almost forgot!): Flying stuff! Bill Henley's twelve-foot Plankenstein

Almost

The first four of us find perfect flying winds, *almost,* on Table Mountain, northwest of Ellensburg, late one Friday afternoon near the end of June. The winds are hitting our favorite flying bowl dead on at twenty miles per hour. There's only one problem, exemplified by the following quotes:

"I wish I had brought my down sleeping bag. I always think that because it's summer, I can bring my light bag."
– Damian Monda, a while later, as we all try to keep warm by the fire.

"I wish I had brought my second bag."
– Philip.

"Air cools about three degrees per thousand feet of altitude just from pressure differences. So here at 6,000 feet, it's eighteen degrees colder than at sea-level even without the cold-front moving in." – Philip. (That's about right for moist air. For dry air it's over five degrees per thousand feet, but this is Washington, so somewhere in-between.)

Bill Henley throws his 12 foot span Plankenstein into the void above the abyss. Photo by Philip Randolph

Left: Damian and Steve trying to stay warm Friday night. Photo by the author. Right: Sanders, Saturday, with Mt. Stewart and the Enchantments in the background. After the trip Sanders wrote, “Why am I always bald and flying a Herring?” Photo by the author.

From the next morning: “At midnight, my Subaru’s thermometer said it was thirty-seven degrees outside. – Steve Allmaras.

“At least there’s still abrasive water, to wash hands with.” – Philip, two days later.

A while after we arrive and set up camp in trees atop cliffs, Steve says, “I suppose we could go back to the bowl and fly.”

Damian says, “It’s too damned cold.”

So we eat.

“It smelled like cooking Goodwill in a microwave oven”

Mike Zanol is the CEWAMS with the intelligence not to fly stuff, other than a Guinness. He’s a Wenatchee attorney of solid historical membership in our non-organization, which therefore can’t have members. He says, “If I don’t have to have planes, I can relax.” And his is the next quote:

“I saw this little six-ounce package of New York steak that was priced way high, and right next to it was a four-pound package of New York steaks for not all that much more, so I got it.”

Steaks on the griddle.

The griddle: It’s so big it dwarfs the Coleman stove. Mike says, “I got it out of my parents’ basement.”

So Mike and Damian are heating this thing up and Mike is trying to scrape at it as evil smelling smoke starts pouring up. But the quote of the weekend is from two days later, when Damian is trying

Above: These weights are almost two inches long. Photo by the author

Right: Bill Henley and his twelve-foot, “Plankenstein,” Saturday. Note the four-wheeler tracks across this fragile meadow. Photo by the author

to explain to Allison and Sanders the paleontology and cleaning of the griddle upon which they are frying a dozen eggs and the second half of Mike Zanol’s three-pound package of bacon. (Mike said, “The little packages were half-again as much per pound as this three pound package, so I got it.” Excuse me, reader, where was I? Oh, yeah, the griddle.

Quote of the weekend: “It smelled like cooking Goodwill in a microwave oven.” – Damian

Anyway, the “Fearsome Friday Four” (Damian, Mike Z., Steve, Philip) ate pretty well, and much.

Post supper we built a big fire and regressed to Jr. High juvenility, followed by one miserably cold night.

Saturday: Robot flying time! Adverse aileron induced twist, or, “aileron reversal”

Saturday: Beautiful weather, clear skies, sun! Bill Henley and Sanders Chai arrived Saturday morning after the first pound-and-a-half of bacon. We all head over to the bowl.

Every glider has conditions under which it shines. Philip (me) is actually singing triumphant garbage about keeping his thrice-reconstituted old blue Javelin up through mild sink cycles when everything else was going down. (Phil Pearson calls Philip's Javelin, "Flubber," for "Flying Rubber," but was not present to cast such compliments skyward.)

The show is Bill Henley's scratch-built, twelve-foot flying wing. But Bill says, "It doesn't want to turn. Once it's in a turn, it carves beautifully."

Philip says, "You stiffened its span with a couple big spars, but it's hard to get that much EPP torsionally stiff. The elevons are probably twisting the wing to where the twist makes it roll in the opposite direction of where you tip your stick. Or at least it doesn't do anything."

But he's in good company. Spitfires had such thin wings that the early ones would sometimes roll in the opposite direction of stick input. The Brits stiffened them.

BTW: In a previous quote, "abrasive water" meant, "snow." Here at the first of July, there are still patches of snow to scrub hands in.

A gut-level analysis of the flying conditions: Why wind doesn't always make much lift, and why it sometimes only hits the top of a hill. Temperature inversions are bad for slope lift, as well as for thermal lift.

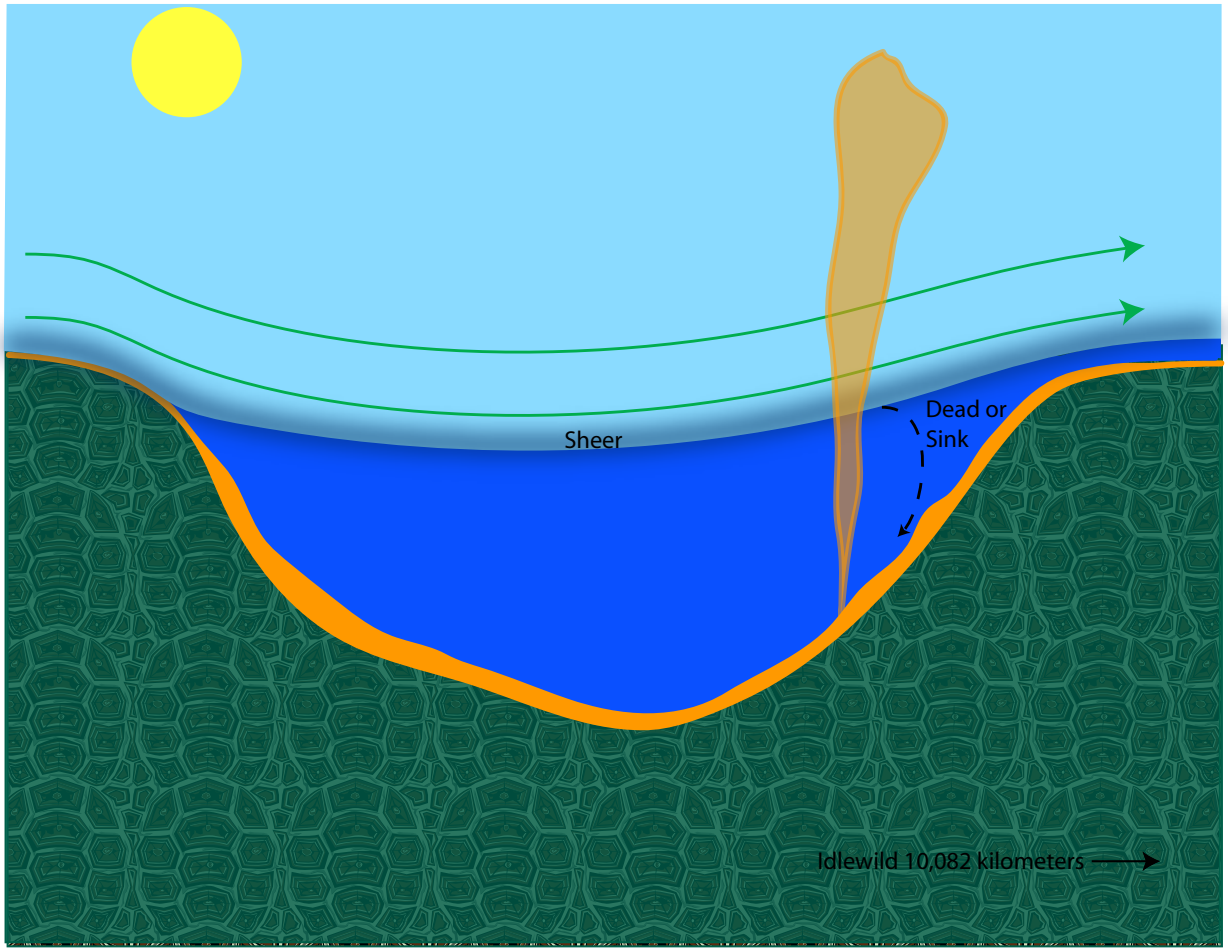


Figure 1: Winds of a warmer front flow across cold air trapped in valleys. That's a classic inversion. The result is poor slope lift. Thermals do get started as the ground heats. That also makes down-thermals. The shear of the wind over the cold air may add down-rotor to sink. The lift band is narrow, weak, and disappears a few feet below the lip of the hill.

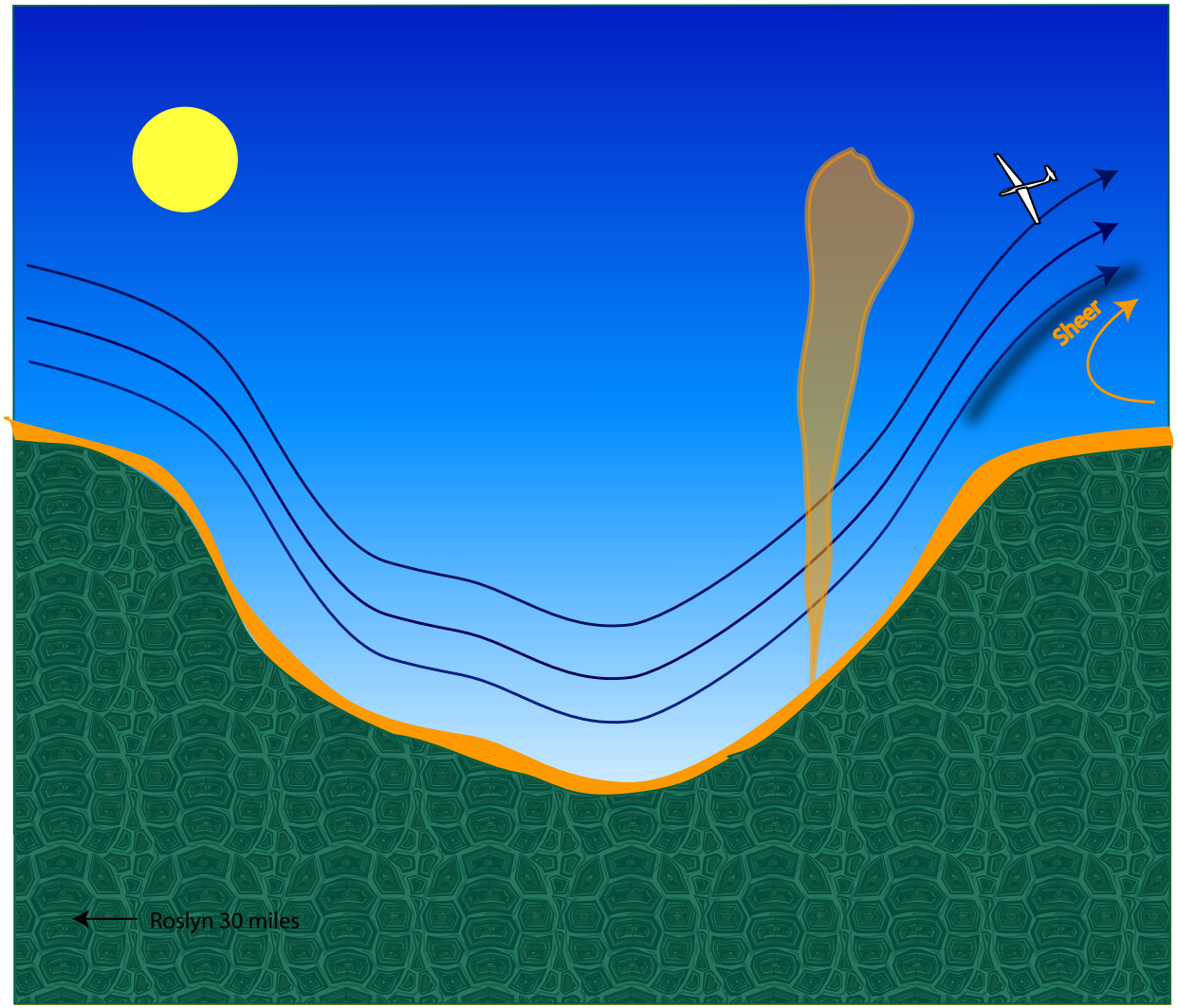


Figure 2: Ideal conditions for both slope lift and thermal lift are the opposite of an inversion, technically, "super-adiabatic." Colder upper air slides down into valleys displacing warmer air below, and follows the contour of the hills. Air warmed near the ground may help the wind to break free from the hill and form a rotor.

Quote: "You see how the wind only hits the top of the hill? A little ways down and the trees are barely stirring. Further down, they aren't." – Bill Henley, between flying his homebuilt, EPP, swept-wing, jet-looking glider.

Quote: "The thermals seem to be small and frequent." – Sanders, flying a Moth, a Red Herring, a Falco, and a big pile of other stuff.

It's not uncommon that slope winds will hit a hill at a shallow up-angle, instead of flowing up the slope of the hill. But this weekend's weather makes one reason that happens evident.

Yesterday's cold, cold air is still filling the valley. The winds of a warmer front are sweeping across. That's a classic inversion, and stable. So the warmer winds float across the top of the cold air, rather than following the contours of the land. Temperature inversions are bad for slope lift, as well as for thermal lift.

What little slope lift happens is in a narrow, weak band near the lip of the hill. Not far below the lip, slope lift disappears.

But: The sun is heating the talus fields and grassy slopes below. So there's a layer of quite warm air beneath that layer of last night's cold air beneath a layer of medium air. So thermals do boil up through both layers. We catch them, but the wind stays on top, blowing nearly level.

Keys locked in. A little far to call AAA. Photo by the author

The sheer between the wind and the lower, colder air, pulls some of it up to us, especially when a thermal is behind us. The sheer also may form a front-side rotor, moving colder air down between thermals bubbling up. Sink. There's plenty of it, more down low.

The ideal, "unstable," thermal and slope lift conditions are when the atmosphere is super-adiabatic—when the temperature decreases with altitude faster than can be explained just by drop in pressure.

If a cold wind charges across a valley of warmer air, it will be more likely to turn down and displace that warm air upwards. That is, the wind is more likely to follow the contours of the land.

So we have a good day of challenging flying, the snows of jagged Mt. Stewart, Mt. Rainier, and Mt. Adams, and a few local snow patches shining in the sun.

A break-in. Night life. Cosmetic augmentation

The original "Friday Fearsome Four" are all about ready to head down to the Brick (of Northern Exposure fame) in Roslyn (ditto). Damian's brother Adam Monda is the guitarist for Massy Ferguson, playing there.

Allison Woods finds us, via the paper plate Damian mounted on a tree, that reads, "DORKS."

Allison says, "I must have bumped the locks when I climbed out of my rig."

That should explain the photo of Allison beating on her Xterra's smallest window with a two-pound hammer. That's after Allison beats on her own window. Bam. Bam. She says, "Oh no. These windows are made of Lexan. They won't break."

Mike Zanol, being an attorney, reads the fine print on the bottom of the window. It says, Lexicor." Mike says, "Let me try." He takes bigger and bigger swings. Sanders has put blue tape on the window to stop it from shattering every which-way. Ten minutes later it shatters every which-way, spraying the interior with fine shards of sharp whatever it is. Philip says, "You should have put the tape on the inside of the window."

Roslyn was once a quaint, sleepy little town. It still sort of half is, but it has a tumor. Heading into town you pass a big sign that reads, "Suncadia." So the Brick is filled with a mix of young persons, logger types, sly young guys, and cosmetically enhanced Suncadians. I mean, the female Suncacidans. The male(?) (okay, the question mark was derisive) Suncadians look like business persons, which isn't a bad thing, except when they're a tumor on Roslyn. Allison says, probably of the female Suncadians, "They don't have any wattles and their faces and chests are all done, but they still have sixty-year-old butts." Well not all of them are surgically enhanced. I mean, there was the one with Anglina Jolie lips plus cantaloupes, but the guys

mostly don't have cantaloupes, except as possessors of the cantaloupes of their wives or whatever they are, and really, most of the people just look kind of like people. It's just a skewed *proportion* (of cantaloupes and Angelina Jolie lips). A number of young guys get kicked out. A bartender explains to Allison that they kick out the drug dealers. Philip says, "Getting rid of the competition," as he sips an Iron Horse Cream Ale made in Ellensburg.

Massy Ferguson, which of course is approximately the name of a tractor company, sounds great (the band, not the tractors), though of mandatory loudness.

Damian is this big guy with seven brothers and one sister, so it's not a surprising coincidence that another brother, Steve, and his buddy Jon Dootson show up in spite of Damian and Adam. They will spontaneously decide to join us camping, for which they are warmly prepared with 1970's style, inverted sheepskin, skinside outside, woolly side inside, imitation Afghanistan trench coats that make them look like Chevy Chase and Dan Akroyd in, "Spies Like Us," but with labels from California, to be used as sleeping bag substitutes (the coats, not the labels).

The Brick seems mostly a couples' place to boogaloo. Nobody seems to dance with anyone other than who they came with. Steve Allmaras says to Philip, "Were you trying to get the --- beat out of you?"

A bit later yet, Steve A. explains to Mike Z., "There's this guy who's big as a gorilla and Philip goes up and asks his girl to dance." She said no. Philip walks dejectedly back to his stool. The couple hug each other affirmingly, or reassuringly, or she him, and then leave. What? Bother. I hate breaking up marriages.

Between songs some guy, well, your author, keeps shouting out, "Play 'Buffalo Gals Won't You Come Out Tonight.'" Maybe you had to be there, but maybe it's better you weren't, because it's just a tavern scene, from which we all to some extent want to escape, so eventually we do.

Back to wake Sanders, who has thrown his sleeping bag out next to the fire-pit, and grumbles at those who quite insensitively want to start the fire again and make loud noises and stay up for another hour listening to imitation Chevy Chases and Dan Akroyds in their faux-Afghanistani inverted sheepskin pimp coats rambling about titanium dirigibles and sheets of carbon fiber foam in which the bubbles are made of helium so this stuff is of neutral buoyancy in air, meaning we're all nerds and dorks on this bus.

Philip says to Jon, "Your coat is longer than Steve's." Steve says, "His just looks longer, because he's shorter."

Sunday. What guys talk about. Slow DS. Flugels.

Sunday morning about seven I hear Sanders, outside my tent, saying, "Hey, Philip, wake up." 7:30, ditto. Eight, ditto. Sanders doesn't know that he is wisely taking his revenge in advance.

We flip each other total garbage on these trips. The problem with reconstituting Jr. High School is that once in a while the crap we talk gets through someone's armor. But then someone unruffles feathers. As we all gather around Bill's drip coffee maker that you fill with water and plunk onto a Coleman stove, Sanders quite diplomatically, well, in his own words, tells the offended party, "Hey, I'm sorry I was Bitch Boy last night, about you guys wanting to start the fire up again."

Philip says, "That's very gracious and diplomatic of you." That's seriousness, and recognition of the sort of social skills and good will that allow us to act as if we didn't have social skills or goodwill (I don't mean the stuff from the microwave oven, or to imply that we usually smell that way, though Jon Dootson does explain that he gets his Afghani sheepskin pimp coats from thrift stores, however, unlike the griddle, he doesn't cook them, on camp stoves or microwave ovens.)

But then it's back to the humor some might be offended by: Philip has a moment of recognition: "But I think

Mike Zanol and his huge package of steaks on his infamous griddle. Note the "ARF" on Damian's camper. It used to say, "ARE." Philip doctored it two years ago with electrical tape. That's Steve Allmaras standing on Mike's elbow. Photo by the author

you've named yourself a new handle, Bitch Boy." Sanders laughs. He'll get Philip back by earlier trying to wake him three times.

Philip then says, "But it doesn't explain just whose Bitch Boy you are." Gawd we are immature. I mean, Philip also shouldn't have told Sanders he was going to get a shot of his Red Herring reflected in the shiny spot on Sander's head. But then Sanders shouldn't have pretended to add mostly water to Philip's rather narsty tasting BBQ Doritos. Jokes about improving the flavor.

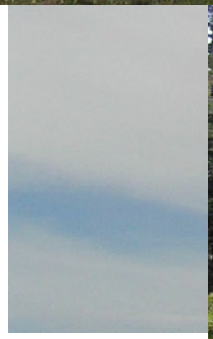
Allison says, "Philip, when you put sunscreen on, you missed the thin spots at your temples. They're pretty sunburnt." True. I forgot a hat, and didn't want to take the one on some old guy's memorial, that looks out over Mt. Stewart and the Enchantments. Besides, I didn't see the hat till Sunday, which might have been the day of his lord or something, and late Sunday to boot, and also, it wasn't in good shape. (I mean, the hat. The memorial looked new, and the old guy was probably ashes.)

Sunday about after the huge more-bacon breakfast, Damian heads out to the basalt cliffs with his black Javelin. This is an intrepid-slope-explorer-Chris-Erikson sort of rock pile heaven. We don't really like these cliffs because the recovery zone is a steep talus slope, and the landing zone is a narrow, rocky strip of grass and wildflowers. Damian and Philip reminisce (whine) about the time three gliders got blown around the corner by sheer. "They ended up hundreds of feet below. One of them took two weeks to find."

But Damian launches. Boom, lift angled way up. That's why Chris Erikson likes some of these places, in spite of his infamous six-foot delta, "Sheetrock," being one of those blown around the corner here. But hey, it only got a grapefruit-sized chunk of foam torn out of it.

So Philip gets his many-times repaired, blue Javelin. And!: Standing on those cliff tops, he feels wind from his back. Rotor! He does low, flat DS circles through the rotor atop the cliff and the up-winds outboard. (See picture in Philip's August *RCSD* DS article.) It isn't screaming fast DS, and the Javelin's drag (or sink to the outside of the DS circle!) makes it hit a top speed pretty quickly, *but it's a blast!* Till after the first tree. After the first tree, the five-minute epoxy stopping the Javelin's vee-tail's shaft from rotating inside a fresh tailboom, doesn't. Tree landing deux. No additional damage. Temp tape fix the revolving tail.

Mike Daily shows up and Chevy Chase and Dan Akroyd leave and we go fly the bowl in light overcast. There's some lift, but as the overcast develops, the thermals dry up. Bother.



Above: Philip setting up for a DS run over basalt fingers, Sunday morning. Trusty old Javelin. Photo by Sanders Chai

Right: Right: “Look how close to the trees he’s flying that thing!” Well, actually, yes. Too close. It’s stuck in the tree. Photo by Sanders Chai

Upper right: The punch line of even mild DS is damage. Tail twists, post tree. Photo by Sanders Chai

Half a mile south, a couple idiots are driving a strange 4x4 up the fragile wildflower ecosystem atop the cliffs. It isn't far from where a few teenagers drove off last year, fatally. A ranger happens by just a little too late.

Mike Daily, Steve, and Philip stop at Joe Watt Canyon on the way back. The wind gage says 20. Winds tend to whistle down the Kittitas valley. Philip breaks a third airplane, seems to be three per trip lately, but not seriously. Steve is flying a Boomerang, which is hard to break. Mike Daily's Mini Weasel flies ridiculously well, with a Dervish roll rate, but then he gets out his Uber-Moth, which screams around ridiculously fast.

We go home, I with one more entity than I arrived with:

Tick Watch — they ride home in clothes and camp gear — and other pests.

This time I found the tick before he bit. He was in my pocket, apparently romancing my cell phone. When I emptied my pockets before stuffing camp clothes in the washer, he rode out on my fingernail. Little red guy, very flat. I tried to flick him into the *flushoir* (that's French), but he made his escape.

I found him again the next morning. By my *appliance de floosh* my knee bumps a little stool. (No, the kind with legs.) My cell phone was on the stool (still the kind with legs). Mr. Tick must have been hanging with my cell phone again. So pretty soon he's strolling up my thigh like the stunted four-wheeler thing we saw crawling the edge of the cliffs. Killed the little stump-biter (the tick (the thing with legs), not the four-wheeler (wheels)). Damian talked to the ranger who happened by about that (the four-wheeler, not the tick) and we'll forward pictures of the thing (the four-wheeler) to the local USFS station.

Damian expressing the mood of the trip. Photo by Sanders Chai

Ticks are worst around oaks, like down near where CEWAMS founder Chris Erikson and family lives, and where they (the ticks, not the Eriksons) have a life cycle that involves acorns and chipmunks. But they're all over.

The moral: Even away from the Erikson Tick Belt, Deet on trouser cuffs etc., and maybe even tucking pants into socks, is preventative. (Of ticks. Spraying Deet on eco-tromping four-wheelers probably just makes them mad.) ■

Uncle Sydney's Gossip Column

"Uncle" Sydney Lenssen, sydney.lenssen@ntlworld.com

Euro Prospects

In two weeks time, Hollandglide will be over. Let us hope that the Dutch at Deelen know how to work the weather miracle and avoid all rain and high winds. Then many of the competitors will be making their way to Trnava for the European Championships and the Trnava Cup. Time to do some forecasting, hopefully with more success than last time.

The sixth European F3J championships in Trnava, Slovakia has attracted 60 senior pilots and 37 juniors to compete for the second most prestigious prizes, second only to the world champs. The Trnava Cup which will be held 17, 18 and 19 August before the main event and is open to all F3J pilots has attracted 156 entrants so far. That will be a stern challenge too.

The most remarkable feature in advance for the championships is that 40 out of the 60 senior pilots from 20 countries were at the World Champs last year in Martin, and 24 from the 37 juniors - 16 countries - were pilots last year. As much as anything, these FAI contests are an opportunity for the F3J enthusiasts to renew friendships and compare latest ideas, models and techniques. F3J contests are mostly tight to the finish with split seconds and five landing points making all the difference between top places. It is unlikely to be different this year.

Over recent years this Gossip column has run through most of the team members and managers, with odd bits of commentary. This year events have conspired to leave me with little guidance on form. Models seem unlikely to have moved on much, according to my information, but we shall soon see.

So instead of having to plough through lots of names, I shall pick out one or two highlights, with predictions to guide the betting.

The number of fly-off places will be officially announced by contest director Milan Blazek at the start and could be 12. These are likely to come from David Claeys, Belgium; Adrian Lee from UK; Damir Kmoch from Croatia; Primoz Prhavc from Slovenia. (I omit Primoz Rizner from Croatia this year because for the last two years I have seen him as the top place winner and he has let me down. I know it makes him even more nervous to be favourite!)

Sebastian Feigl and Tobias Lammlein from Germany seem set to make the last rounds and they will likely be joined by Philip Kolb, flying this time as reigning European champion and not part of the German team. In the last Gossip, I reckoned he had already won the F3J Eurotour after five events. He is certain winner having scored 103 again in Sofia last month.

Jan Kohout, another ex-champion, will join Jaroslav Tupec from the Czech Republic in the fly-off. Jaroslav told me last year that he was too old for international championships - I can give him more than ten years, but I'll never fly like he can - and I'm pleased to see he changed his mind.

The Italians were magnificent last year in Martin and enjoyed noisy support. This time Massimo Verardi will make the fly-

off again. Frank van Melick from Holland, one of the few to fly his own-design models is a good fly-off bet. Incidentally, if you want the best restaurant in Trnava, then follow the Dutch team led by manager Jos Kleuskens because he will have booked the best table there. Host country Slovakia will win two fly-off places I bet, Juraj Adamek and Jan Ivancik.

To complete the fly-off list I've dithered between the three Turkish team members. Many neutral supporters in Trnava will want this team to do well since they will be hosts for the 2008 world championships in Istanbul. My bet is Murat Esibatir.

Fourteen names for twelve places are my best guesses, and I wish everyone, named or not, the best of luck, no unfortunate mid-airs and enjoyable protest-free flying.

Who will be the new champion? Favourite for me is Jan Kohout, for he will be trying seriously hard this year. Team prize? My hope is Slovakia as hosts, but equally likely are the Czechs or the Germans, who will have the youngest senior team on the airfield.

Muddy tales

UK's awful summer continues, and so far we haven't had an F3J competition which has not been hampered by showers, storms and winds. We live in hope that one day this year we shall enjoy a thermal competition. We came close at Twywell last weekend with most of the slots flown out, even the flyoff in the early evening. It did manage to spatter a few drops of rain during two of the slots, just to be perverse.

But we flyers cannot moan: in England thousands of houses have been flooded, 120,000 families have been without running water for more than a week, 20,000 homes are without electricity. Guesses on the causes include a southerly shift in the Atlantic jet-stream, global warming of course, but in fairness most continental Europeans expect the English summer to be wet.

The UK leg of the Eurotour, Interglide took place June 23/24, and Tobias Lammlein from Markdorf in Germany flew over to take part. Allow me to share some of the trials and tips.

For those who don't know Tobi, he was World Junior F3J champion in Lappenranta in 2002 and he will fly in the senior German team this summer in the European championships at Trnava in August. He's a top pilot. He is in his second year of a mechanical engineering degree in Switzerland, and the weekend break to get to Interglide was at the end of term.

Tobi lives 15 minutes away from Friedrichshafen, from where you can fly with Ryanair to Stansted in 90 minutes. Big snag was that his model box did not arrive, and by 9.00 pm all hope of flying his three models was gone. We phoned my friend Andre Borowski at the hospital in Enfield and borrowed his Sharon Pro for the weekend. Tobi started programming the model into his Graupner MC24 at 11.00pm, added an extra 30 grams in the nose, went to bed for a few hours before leaving at 6.30 am next morning for Marsh Gibbon.

Prospects were gloomy, plenty of rain forecast for the next few days, but on reaching the field, the rain had stopped leaving lots of mud. Walk within a metre of the ground sheet on which models were assembled and the wings were splattered with mud, which dried like cement within minutes.

Tobi did a handlaunch to test his settings, added another lump of weight in the nose, flew in the second slot and scored a thousand with his first towed flight, then went on to take second place in the fly-off. If ever proof was needed that it's the pilot that counts, not the model, this was it.

Couple of highlights from his flying: in the second slot Tobi was circling tight with three other models and came close to a mid-air. "I'd forgotten it isn't my model," as he broke away to look for some lift in isolation. Then in the flyoff, flying really high, far beyond my vision as spotter. "I must be careful," he said, "I'm close to cloud." A minute later, "It's in cloud." It

seemed an age to emerge, and I would never have found it with my eyes.

The real treat for me was having Tobi as my spotter. I gained tenth place, far higher than normal, and that was 100% due to his bullying and guidance. Several times my Supra flew far beyond my normal boundaries, not only for visibility but also risking safe return. Each time Tobi was confident that lift would be there - and it was.

How can he know that lift is most probably there? “It’s a hunch,” is his explanation. How does he know which way to fly after the zoom? He spends plenty of time following models flying each slot, but in the 30 seconds before his own launch, he claims that he remains unsure of which way to fly: “Usually that decision is when I’m in the air.”

For many seasons, Tobi’s spotter - Germans call it “coach” - has been Philip Kolb, especially in FAI championships, and experience of each flight presumably rubs off. Is that how you learn to read air? As a young boy his father Stephan Lammlein coached, but for competitions the father/son relationship became too close for comfort and Stephan stepped aside.

I remember last year at Martin’s World Championships, Joe Wurts launched all three US juniors and did the spotting. The pilots were excellent flyers, and Joe’s guidance was terse: “I don’t like that sky - better left.” (Or similar) All the time Joe was looking round, 360 degrees. When a move was needed, his direction was ready.

My problems with spotting are first vision, then spending too much time watching my pilot’s model, then advising too late that someone has got reachable lift, and then persuading my pilot that he might try for it. Most spotters I know spend most of the 10 minutes acting as co-pilot, which is usually a waste.

Biggest laugh I had timekeeping a couple of years ago in the Hollandglide fly-off, was when an ex-world F3J champion flew with a new spotter; his usual mate also being in the fly-off. Half way through the first 15 minutes, I overheard: “Look, I don’t mind if you don’t say anything. I don’t really mind if you keep on talking. But whatever you do, don’t talk stupid!”

So drink a toast to all spotters, as vital to success as any pilot. The same goes for the towmen! Wouldn’t it be a good idea of some of our best spotters spent a little time trying to coach us mere mortals how to do the job better!

Interglide was the first time in my UK experience that the contest director insisted that we flew some rounds in the rain - admittedly light but continuous - to ensure that the event would be valid. Anyway Tobi was due to fly in the next slot and asked if I’d got any “XYZ” which I could not translate, for his wings.

Turning to Adrian Lee, he borrowed some washing-up liquid from his caravan, and wiped top and bottom of the wing and tailplane surfaces, just the gentlest of smears but leaving the wings sticky and slightly slippery. Tobi wanted the liquid to disperse any water bubbles collecting on the surface as the model flew, to minimise aerofoil degradation, presumably the green stuff breaking surface tension. When the model landed at the end of the slot, there were no bubbles, and the slot was won.

To end the saga, Tobi’s three models in the box returned to Friedrichshafen one and a half weeks later, apparently via Palma de Mallorca. He has still to see his 50 Euro “sporting luggage” fare refunded. Ryanair told him several times that they were a low-cost airline with no electronic label facilities and they could only find the box when it turned up. Two days after the box returned home, Ryanair phoned up asking if he had found the box yet!

At Stansted airport I discovered that if you inquire about lost luggage, you cannot talk face to face with anyone, you can only speak on one single phone at the far end of arrivals, and that phone is usually engaged. But if it weren’t for low cost air travel, many of us wouldn’t get to many Eurotour contests. So take it or leave it!

Radio revolution is here

Only in the last two weeks have I flown a model with synthesized transmitter and receiver, with complete success thankfully. I remain suspicious. With a box of crystals in my transmitter case worth far more than the transmitter itself, I feel slightly done by. Also after three decades of relying upon crystals to make my models work and avoid interfering with others flying at the same time, crystals take on a spiritual importance, like candles on an altar, and I'm loathe to abandon them.

But I am told that synthesized transmitters are now accepted by top pilots as 100% reliable and convenient in use. I have heard some doubts about synthesized receivers, vulnerable to mobile phones etc., by nobody I know has blamed them for a crash or interference. Again the habit of changing and checking crystals dies hard.

The world of serious model radio-controlling is about the change again with 2.4 GHz transmission, not the sets which have been selling for the last year or so with limited range and only recommended for indoor and park-fly models, but Graupner's new Intelligent-Frequency-Select (iFS) system, due to become available in August - any day now.

Both the new transmitter modules - you can continue to use your existing set - and receivers have a host of features too long to list here. Extra special to my mind is that Graupner says that up to 120 models can fly at the same time. The receiver and transmitter talk to each other all the time, and your model and trannie will change frequency as soon as interference is detected. As pilot, you will not be aware of any change.

Airborne sensors in the model will send real-time information back to the transmitter on a four line LCD screen, and you will be able to track battery voltage, height, air speed, temperatures etc., and the feedback can be converted into audio signals into your headphone. This part of the system is still under development, say Graupner, and they reckon up to 256 sensors in the model can be monitored. What can that number be useful for?

Most importantly, the transmitter's output power can be adjusted between 10mW up to 100mW, because different countries have their own regulations on what is permissible. The eight and ten channel receivers which will be on sale will have a range of 800 metres on the ground and two kilometres in the air, if you can see that far. The transmitter aerial is about 12 cm long, and the receiver has a tiny stub aerial too.

For the technically inclined, all this sounds pretty impressive. But for me, I wonder what the reactions will be among the powers that be in FAI, what changes might be triggered eventually in all the F3 class competitions.

For the moment it is quite simple. IFS will not be allowed in any F3J competition because: "Any device for the transmission of information from the model aircraft to the competitor is prohibited." But that can't last for long.

The whole approach to running competitions to date has been the limit on the number of pilots who can fly at the same time. Hence we have man-on-man rules, that is a number of rounds with several groups (slots) in each round.

The limiting factor in future could be how many gliders can be flown and landed on targets reasonably safely at the same time? - 20, 30 or even more. I suspect that we will not see 120 models up at one time, although that would make the model manufacturers rub their hands in glee.

With slightly modified rules and staggered launches, you could certainly have two or three times as many flying in each group on most contest sites. That could be fairer and more exciting. The many and various options which iFS opens up, if it proves as successful and reliable as promised, will certainly lead to some healthy debates in the not so distant future. Tomas Bartovsky and the folks in Lausanne are going to be busy!

End of gossip for now. ■

Let's Build a Genie!

Or "How to Get an Open Class Glider the Fun Way, Not the Buy-N-Fly Way"

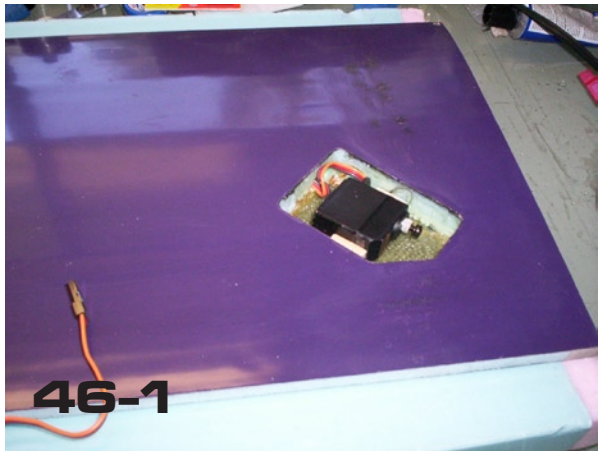
Part 6: The Genie has left the bottle! Chris finishes what he started...

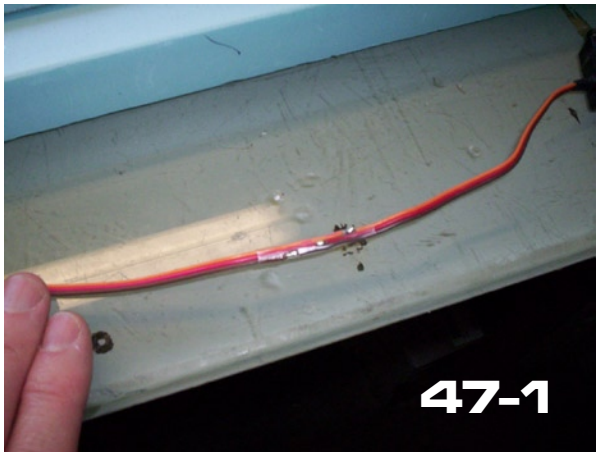
by Chris Boultighouse, caboultinghouse@yahoo.com

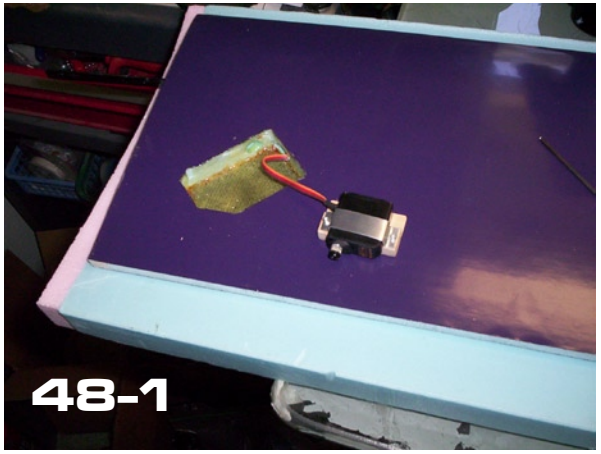
To quote the famous songwriter, what a long strange trip it's been! The Genie project, which began back in March of 2006, finally took to the air on July 14, 2007. Along the way there were distractions, stress, and pox. But in the end, the call of the thermal was stronger than all that, and I finished the darn thing!

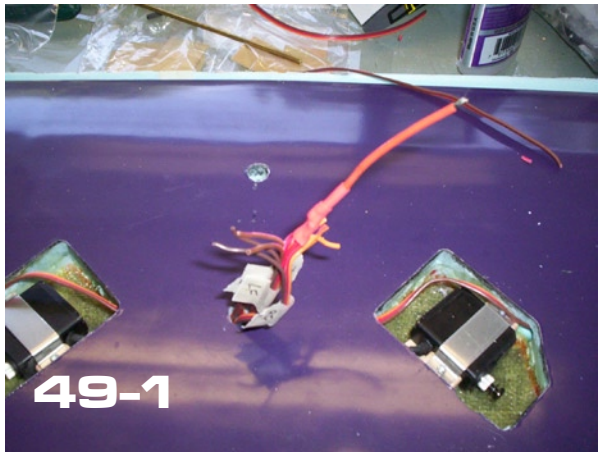
When we left off, the wings were bagged and ready for the "real work" to begin. The control surfaces were cut free using a bandsaw and coping saw, and bevels sanded per Harley's instruction documents. Be sure to wear a good mask when cutting or sanding carbon fiber! (45-1, 45-2)

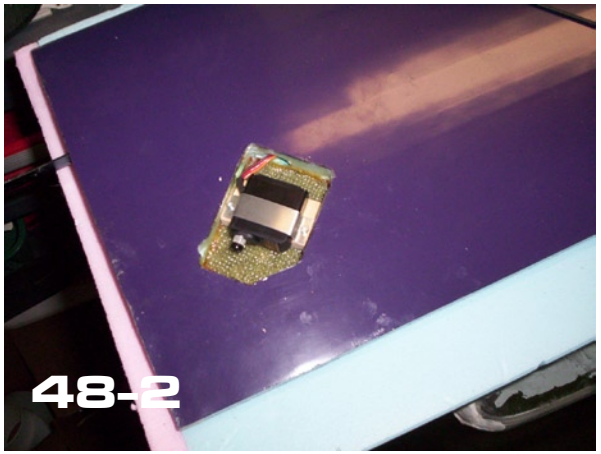
I followed Harley's recommendations when it came to making a router template and custom router bit for my Demel to cut the servo pockets. Other than a couple of small "oopsies" the process went well, and I ended up with generally neat servo pockets. I know another Genie builder who simply marked out the servo pockets and carefully cut the skin freehand with a rotary cutter on his Dremel. To each his own. The important part is the placement, and (as usual) Harley's measurements and instructions were spot-on. (46-1)

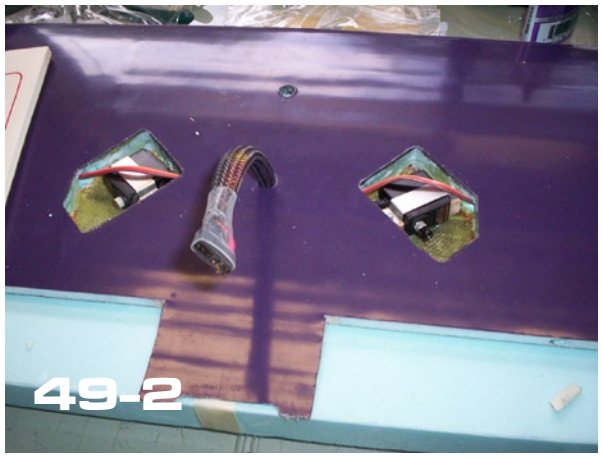








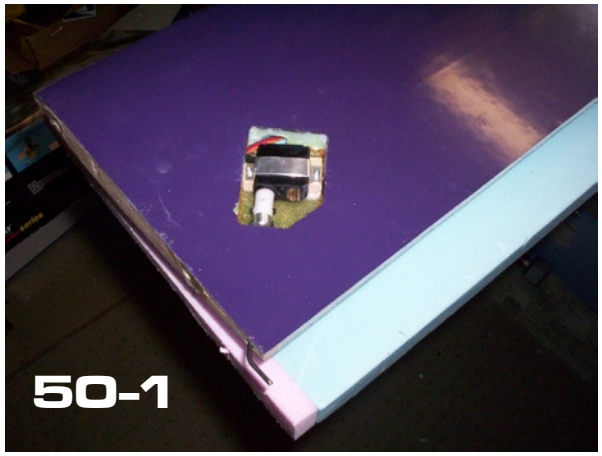


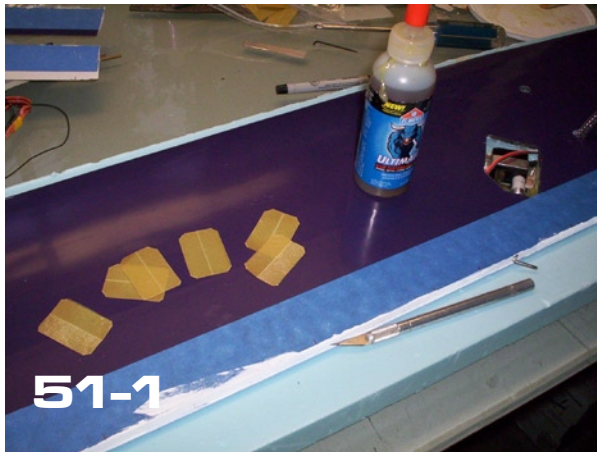


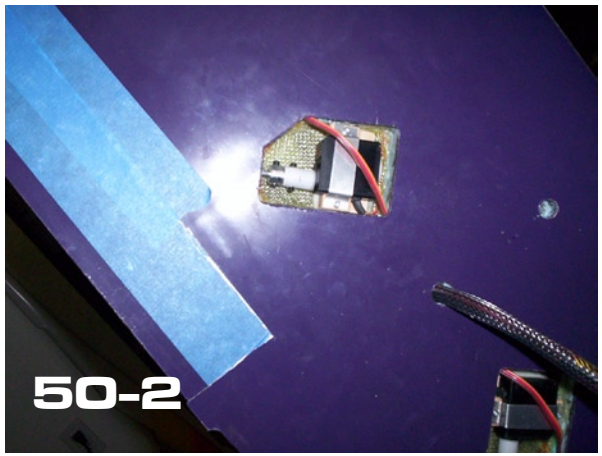
Once the pockets were cut, it was time to begin the dreaded radio installation. I always dread this part, for some reason, even though it means the model is almost complete! Yes, I know I'm weird. I didn't skimp on the radio for the Genie, and purchased JR DS368 servos all 'round. For those who don't know, Don's Hobby Shop in Salina, KS is the place to go for all things JR. He's a great guy, and has great prices. He also set me up with a Fromeco 2400 mAH Li-Ion receiver pack and 6V regulator to power the JR 790 synthesized receiver, which nicely compliments the synthesized module in my JR 9303 transmitter. Onward! Extensions were soldered onto the aileron servos and the wires were fished down the tunnels. I stagger the solder joints when doing extensions so a single piece of heat shrink covers the entire splice. (47-1)

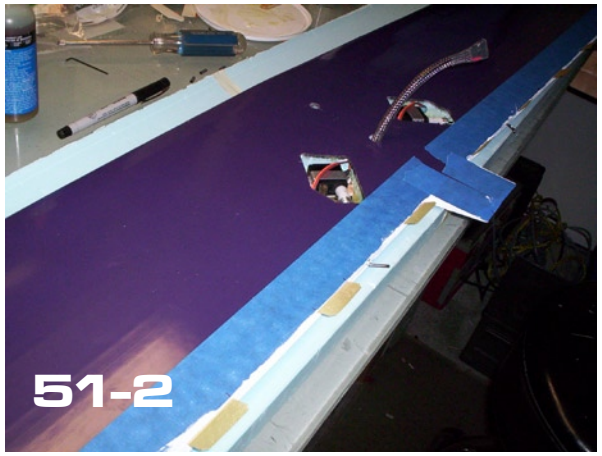
Harley details the making of servo mounts, details which I followed except I used 6061-T6 aluminum for the retainer straps rather than brass. These mounts are simple, clever and effective. Don't try to improve on them, just build them! (48-1, 48-2)

I used two 3-pin deans connectors, glued together and reinforced with a scrap of leftover wing spar cap. I reversed a couple of the pins so it cannot be plugged together backwards. After what seemed like hours of soldering (preceded by careful labeling of course) the whole mess was covered with wire sleeve and heat shrink. With some trepidation, I plugged it in and.... it worked! And most importantly, the magic smoke stayed in. (49-1, 49-2)









Next it was time to begin the fitting and setup of the RDS. Since I went all-out on the servos, I also purchased the optional machined aluminum tops and hardened shafts from Walt Dimick. It's only money, right? Harley has an entire section of his instructions dedicated to the RDS setup, so there's not much I can say here that he hasn't already said. (50-1, 50-2)I made the Kevlar hinges as outlined in Harley's instructions, and installed them with Elmer's Ultimate polyurethane glue. This is a great way to hinge, and I'll certainly be using it for other models too. Prior to cutting the hinge slots I masked off the wing and control surfaces then used acrylic paints to seal up and finish the exposed foam. (51-1, 51-2)

I don't have many pics of all the rest of the little tasks required, like installing the main wing bolt blocks, installing the servos in the fuselage, or Monokoting the tail surfaces, but none of that stuff is very interesting anyway, right?

So, after all this time, was it worth it? I can say YES, with conviction. Even though she's a bit heavier than Harley's birds at 103 oz, she flies with effortless grace and surprising agility. Even in the bad conditions we had for the first flight, I was scratching around at low altitudes working tiny scraps of lift like we'd been flying together for years.

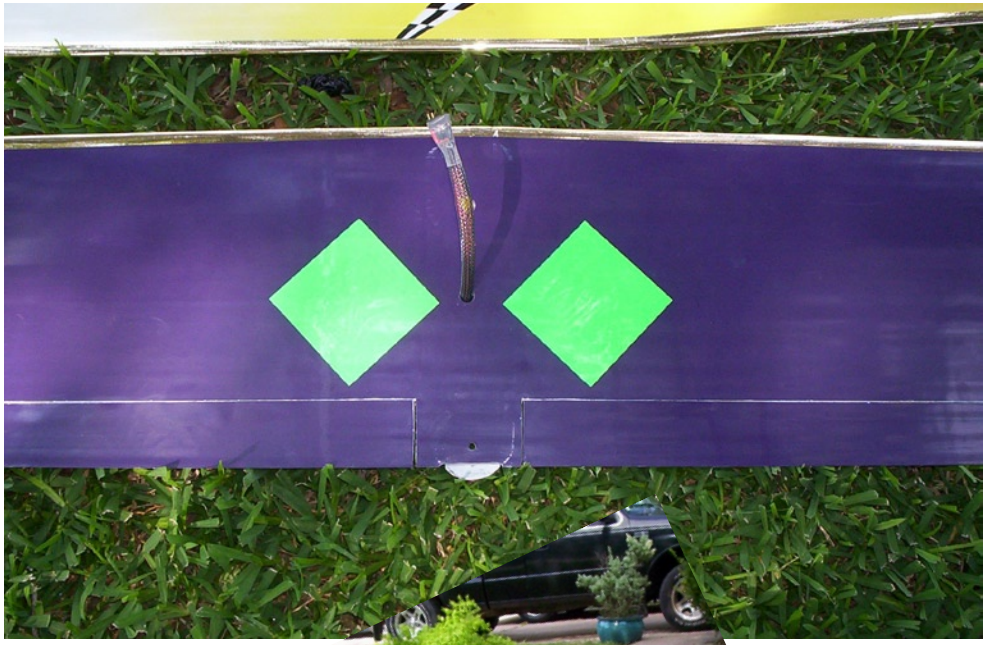
Recently the Austin Silent Flyers had an informal club contest and, despite having only four trim flights in the logbook, I decided to enter the Genie. Even in 15-20 mph gusty winds she performed admirably, and penetrated upwind without issue. The only difficult thing about the Genie is the launch. She's just so darn big it's hard to get a good grip. Poor John Freeman had a devil of a time getting a good launch for me, with several pop-offs as a last minute gust kicked a wing up (and no amount of control would bring her back to center). There were lots of gasps from the guys, but these pop-offs were easily managed from my perspective. John was very apologetic, but hey... it's all good! I appreciated the help! Once we got the launch technique down, she did well and

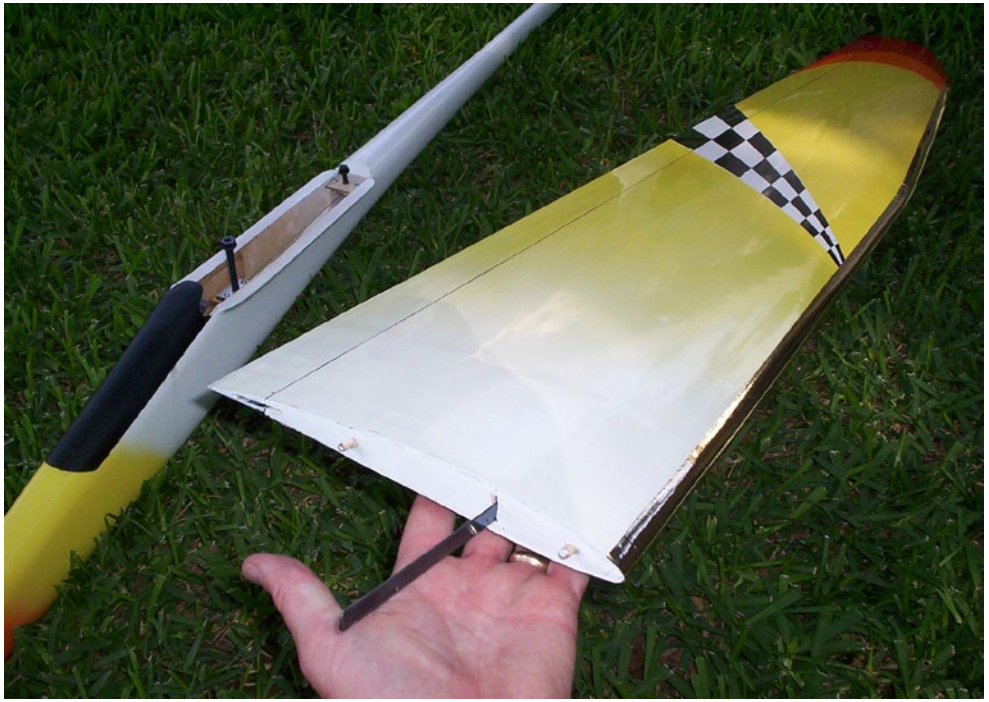
can really zooooooom (there's mass and momentum for ya).

So how did she do? Second place! And this was against a field of moldies too. Of course, I did have to endure some friendly ribbing about the final weight. She even picked up a name I think, when someone referred to her as the "Iron Lady". Ahem. Regardless of the jokes about her weight, I heard several comments about how she grooved back from downwind without losing much altitude, and I pulled off one of those "no way, he can't make it back from that altitude" landings too. With a little more practice and tweaking of the mixes, the Genie is going to be a strong competitor. I'm not sure about me, but the Genie is certainly capable.

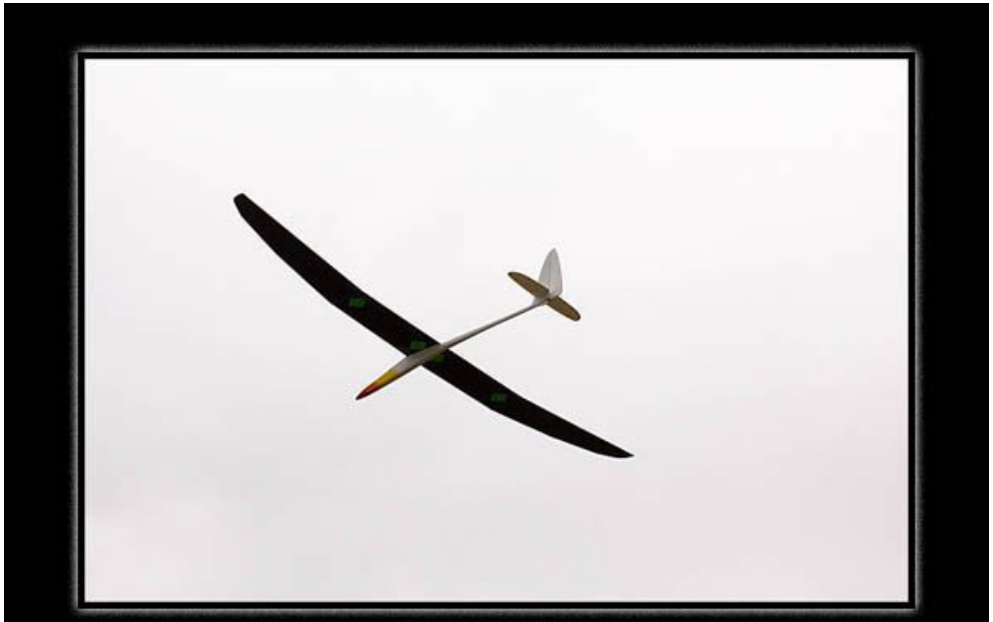
I'll conclude with a heartfelt "Thank You" to Harley for providing the modeling community with such a fantastic design that the average guy can build and enjoy. The Genie truly is a rare combination of beauty and performance. Build one! You won't regret it, even if it takes you as long as it took me.

The rumor mill has it that the "star" of this series, Chris' Genie, is looking for a good home. If you're interested in purchasing this fine bird, contact Chris via e-mail at caboultinghouse@yahoo.com.





Austin Silent Flyers



Austin Silent Flyers

Austin Silent Flyers

Austin Silent Flyers


SP-P587

AIRWORLD Modellbau

fox

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Text by David and Graham Woods

The Fox is an attention seeker. The photos here were taken on a good day. It was a good day for several reasons: the wind was westerly—our best slope at Ivinghoe Beacon; it was about 20mph; it was my first flight with the model and rewarding for me and perhaps the model too. I bought the model, used, from fellow UK F3F flier Greg Dakin who said he had not flown it for a while so I guess it had been languishing, neglected and sad, somewhere.

This particular Fox comes from Airworld in Germany <www.airworld.online.de> and carries the Polish (SP-) aircraft registration. At a scale of 1:3.5 the span is 4 metres and it weighs in at around 8.5kg.

The HQ-section wings use carbon fibre matt and uni-directional carbon to give the necessary strength and torsional rigidity for sailplane aerobatics on a grand scale. The eye opener is the huge fuselage at 2.11 metres (an inch

short of seven feet in American). For a modern sailplane the control surfaces are simple - just ailerons, rudder, elevator and spoilers - no mixers, flaps or variable geometry sections are required just two aileron servos.

So to the air... the Fox is not really something you would normally launch by yourself, you will need a helper, but be warned choose your helper wisely — you do not want a wimpy launch so look out for someone with experience. This model probably flies at around 40mph so even with a 20mph wind you will still need a good throw to clear the slope.

What does it do? It does everything. I did rolls, slow and hesitation, chandelles and lovely stall turns; this model carries a lot of energy with it and the huge rudder gives plenty of control on the way up and down. Inverted flight is really good and needs just a touch of down elevator for straight and level flight. It responds to lift very well and circles easily but another warning — you must keep the speed up — this model is no floater so don't try to make it one or it will drop out of a turn. Mind you, the stall, sudden as it is, was straight on this model. Thermal soaring pilots beware, this model is no slouch and wants to be flown fast. Looping is easy, huge ones too, and bunts, right round if entered fast enough.

It will do cubans and lazy-eights, like I say it does everything even knife edge flight. The snap roll needs a lot of speed but this isn't really the thing for a scale model, is it? As for spins, well it takes time to recover so watch it.

The Fox is a great plane and pulls the crowds even if it just sits on the grass and doesn't even fly. Fly it well and entrance your audience, but at over 8kg and perhaps 100mph this is not for the faint hearted nor the inexperienced.

Unfortunately, our first trip to the slope was not without incident as one the crew of the sailplane undid his harness mid-flight and decided to try to bail out during a minus 10G bunt — he sent the canopy winging to the ground where it split open. Hopefully, a replacement canopy is on its way. The pilot was reprimanded. ■


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Ken Bates' WINDLORD at the 2007 NATS

Photo essay by Tom Nagel

Ken Bates' Windlord originally appeared as a construction article in the March 1978 issue of Model Aviation. With a span of 100 inches and 1400 in^2 of area, the wing loading can vary between five and seven ounces per square foot. Its 1977 contest record was one first, two seconds, and three thirds.

Ken recently built another Windlord and put construction photographs on the RCGroups web site < http://www.rcgroups.com/forums/showthread.php?t=578473&highlight=Windlord >.

At this year's NATS, Ken and his Windlord lead the first four rounds of Nostalgia, with an eventual third place win. See <http://www.modelaircraft.org/events/nats/NatsNews07/0723.pdf>.

Ken with his Third Place award.