Radio Controlled

Soaring Digest

August 2007 Vol. 24, No. 8

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Front cover: Dan Troxell's half scale ASW-28 gets a tow to altitude at the 2007 JR Aerotow. The 40+ lbs. model has a span of eight meters and has a detailed cockpit and pilot figure, making for a very realistic image. Photo by Marc Gellart
Canon EOS Digital Rebel, ISO 100, 1/500 sec., f10, 95 mm

Back cover: Michael Knight launches his Supra off winch-driven monofilament line while preparing for the September Junior F3J trials. Photo by Alyssa Wulick
Konica Minolta 7D, ISO 100, f8, 1/640 sec., 20 mm

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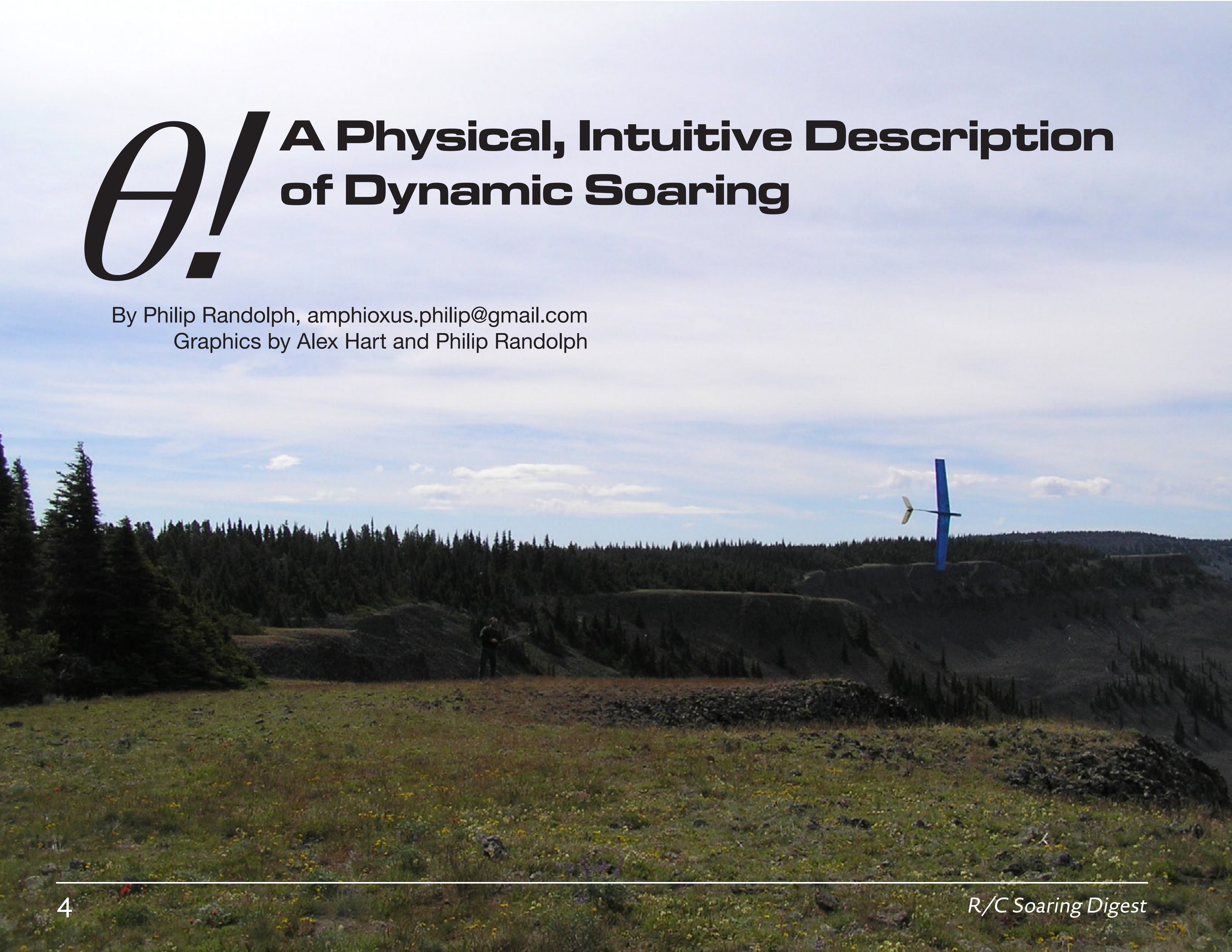
In the Air

The F3B World Championships were held in Emmen, Switzerland, and finished just before the deadline for this issue. The weather conditions during the first few days of the event were challenging, to say the least. Rain kept much of the field working area wet - standing water several inches deep, and lots of mud. One Round was terminated early because of weather conditions and continued the following day. The Herrig brothers, Martin and Andreas, from Germany bested 62 other participants and took the top two spots with consistent fantastic flying. Fidel Frick from Lichtenstein was third. Final team standings were Germany, Switzerland, USA (Mike Smith came in 8th, Tom Kiesling 15th, and Aaron Valdes 16th). Good going, guys!

Web coverage of the F3B World Championships included "real time" results on the official site <http://www.f3b-wm.ch/>, and commentary through RCGroups < http://www.rcgroups.com/forums/showthread.php?t=708862&highlight=F3B>. Additionally, several blogs provided information on specific national teams. Notable in this latter group were those dedicated to the South African and Australian teams.

It is quite interesting to read how various teams are already making plans to practice in adverse conditions at home to be better prepared for less than optimum weather at the 2009 Championships, and how F3F and F3K competition can improve F3B skills.

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.

Installment Two of Three: Arithmetic, Forces, Trig, and Ping-Pong

Where to

This is the second of three monthly installments, Parts 3 – 6 of eight. But for those already familiar with dynamic soaring, it works to start here.

Part 3, "DS Arithmetic," summarizes some of what we covered last month, but with additional depth, at least by Philip standards. This gets us through the arithmetic of dynamic soaring, and two of the three ways to look at DS speed increases—by airspeed jumps at shear transitions, by additions to groundspeed and airspeed per half-circle. The third follows:

Part four, "DS Forces:" This was one of the funnest parts to come up with. We analyze the forces that make DS groundspeed increases. Counterintuitive hint: The *only forces* that increase groundspeed in DS cycles are the centripetal lift forces that make the glider turn in a circle within a moving air mass. (What about wind?)

Part five, "A small wheelbarrow of extras," refines trig effects. Jumps in airspeed are lessened by angles of entry theta (θ) into oncoming wind.

Part Six, "DS and ping-pong elastic collisions," describes DS speed increases as fairly elastic collisions with oncoming air, similar to a ping-pong ball's speed increases during elastic collisions with opponents' paddles.

Next month we'll look at more ways to DS more terrains, and at how fulmars and northern petrels DS waves.

The author and his many-times repaired, EPP Javelin, lightly DSing basalt knuckles at 6000' on Table Mountain, Washington. There was a mild thermal wind blowing up the talus slope and cliffs. Looking out, I felt a light breeze on the back of my neck, and said, "Aha, a rotor! DS!" These weren't ideal conditions for screaming DS velocities, but it was still a blast. 'Til the tree, anyway. Photo by Sanders Chai

θ! Part 3

Wild speed gains, DS arithmetic, and DS Forces: How flying between air currents with opposite velocities can add so much groundspeed to a model plane

Groundspeed increases per half circle, or, equivalently, airspeed increases per each transition through the shear layer

There are several instructive ways to look at DS velocity increases. Two are from looking at increases in airspeed from penetrating a shear layer:

• First, we can look at increases in groundspeed per each half circle. We'll show how at each half circle, a model's groundspeed can be increased by *double* the velocity of the oncoming wind (upper or lower), less losses to drag and to less than optimal angles of shear transition. Or:

• Second, equivalently, we can look at increases in airspeed per each transition of the sheer layer, between airstreams with opposing velocities. At each shear transition, airspeed jumps by the difference in wind velocities, less trig effects, and is preserved in the turn for the next transition, less drag.

• Lastly, groundspeed increases from *forces!* In Part 4, we'll expand our understanding of lift forces and velocity increases in relation to air and ground.

Penetration of shear into oncoming wind adds airspeed. In the turn from upwind to downwind the glider both maintains this new airspeed and takes on the velocity of the wind.

Addition of wind-speed number one: In punching up or down through the sheer layer, airspeed becomes groundspeed plus the velocity of the oncoming wind.

Conversion of new airspeed to groundspeed across the wind: In the turn from upwind to across the wind, the new airspeed is converted to groundspeed across the wind, plus:

Addition of wind-speed number two: Belly-to-the-wind adds a downwind component to the plane's groundspeed velocity, roughly at right-angles to its airspeed across the wind. The model's circular path is carried by the wind, just like how we moved the circular perimeter of our saucepan "downwind."

Alignment of new velocities: In the turn from across the wind to downwind, the airspeed and wind-speed velocities then align and add to a new groundspeed.

See Figure 3-1.

How a glider gains nearly twice the velocity of the oncoming air when it punches up (or down) through shear and turns a half-circle

When a glider punches up through shear into oncoming air, suddenly its airspeed is its groundspeed plus the velocity of the upper, oncoming air. It turns a half-circle *in relation to that oncoming air,* retaining most of its new airspeed in relation to that oncoming air, now both going in the same direction. So as it points downwind, its new *groundspeed* is its airspeed (newly bumped up by penetrating into upper air), plus (a second time) the velocity of the upper air. Wow.

What are the forces that make this happen? Just the pressure, lift forces on wing and air that make the turn. Why doesn't the glider lose a lot of speed energy to the air, in the turn? Some do. Some don't. That's modern design and ballast. In Part Five, we'll see how in turns, efficient planes rebound from air in highly elastic collisions.

The glider repeats exactly the same process when it punches down through the shear layer into a lower, uphill flow. Its new airspeed is its groundspeed plus

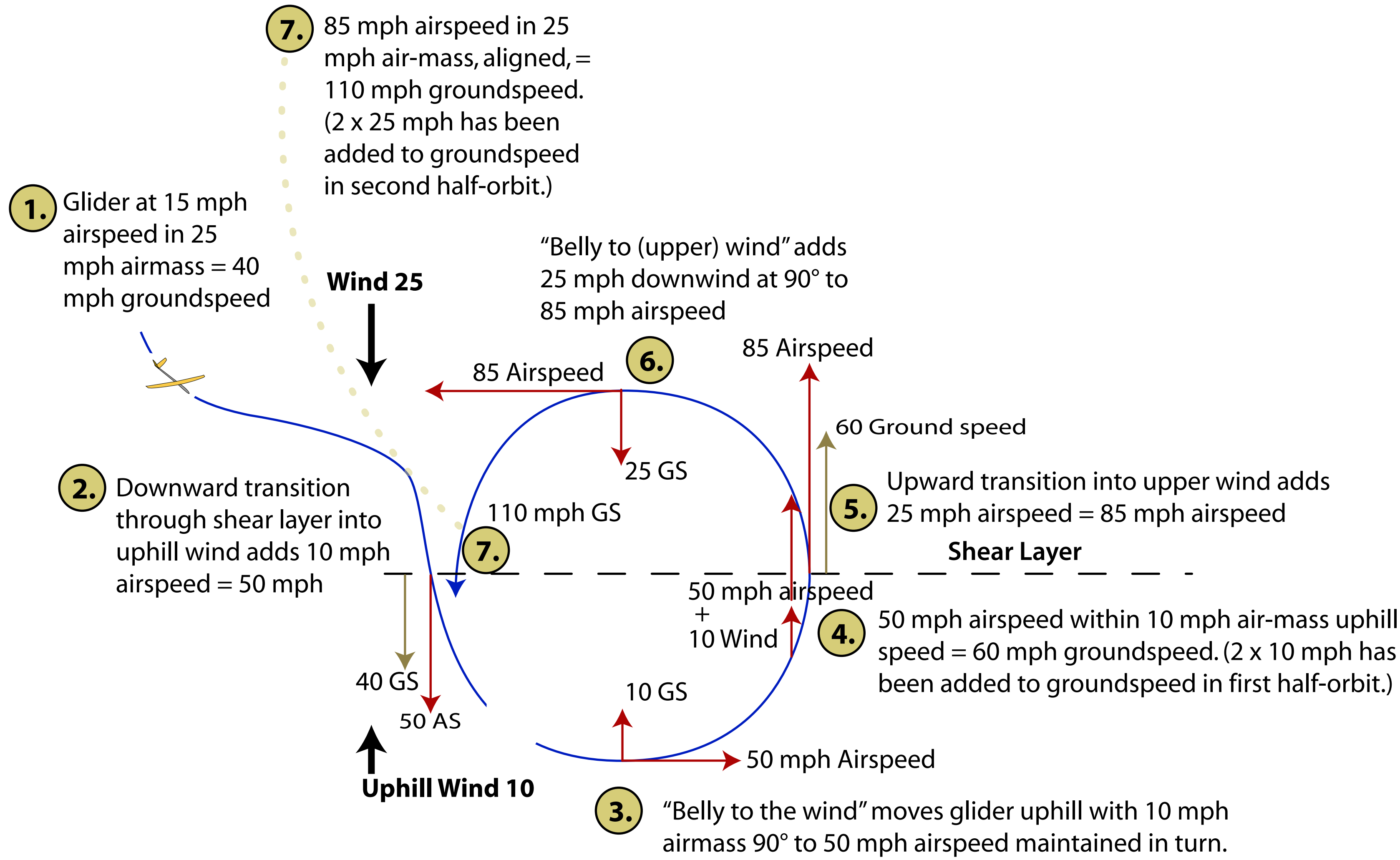


Figure 3-1 DS Arithmetic 1. In each half-circle, groundspeed is increased by twice the velocity of the oncoming wind, less drags and trig effects. Graphics by Alex Hart

the speed of the uphill flow. It keeps much of its speed in its steeply banked turn, *in relation to the uphill flow.* So when it has turned 180° and is headed uphill, its *groundspeed* is its retained airspeed plus the velocity of the uphill airflow. Wow.

Drag increases rapidly with airspeed. At each sheer transition, the glider picks up *airspeed,* until drag and trig effects all limit the maximum possible velocity.

Basic formulae, for them what likes that sort of thing

$\Delta V_G/180° = \cos\theta)\ (2V_{Wind}) - \Delta V_{Drag}/180°$

(Increase in groundspeed per half circle equals initial groundspeed, plus the cosine of the angle of entry into oncoming air (θ), theta) times twice the velocity of the oncoming air, less drag velocity losses.)

This pretends the shear layer is thin.

Note that in the lower half-circle, the velocity of the oncoming air may be zero (if it's dead down there). Or if the DS path takes the glider into down into air moving in the same direction as upper winds, but more slowly, the velocity of the oncoming air will be called "negative." That's like albatross DSing a shear gradient, or a DSing at a small angle to a shear, into where upslope thermal flows turn parallel to upper winds.

Cosθ? In Part Five we'll look more at the trig effects of penetrating the shear layer at an angle to the oncoming wind.

$$V_{Gn} = V_{Ginitial} + \sum_{1}^{n} \Delta V_G/360°$$

(Groundspeed after *n* orbits is the initial groundspeed plus increases from orbits.)

The same increases in velocity, entirely from the airspeed perspective: Each shear transition bumps airspeed by the difference in wind velocities, less drags and trig effects

Additions to velocity are the same per orbit, whether we look at additions to groundspeed per half-circle or additions to airspeed at each transition. See Figure 3-2.

At each transition through a thin sheer layer between opposing flows, the increase in airspeed is the difference between the wind velocities.

That seems very simple. What it doesn't say is that to maintain most of its airspeed through the 180° turn toward the next shear layer transition, the glider undergoes great lift forces. (The force of lift is pressure times wing area.) Lift forces put an opposite pressure force on the air the glider turns in. But this is what gliders are good at, making a lot of lift force with a little bit of drag, thus maintaining airspeed while reversing direction.

If a carbon Sparrowhawk is successfully DSing the difference between a wind blowing south at 20 mph and a horizontal feeder flowing north at 10 mph, at each transition it will pick up 30 mph airspeed. It will lose some of that airspeed to drag.

It also loses to the angles of entering the oncoming upper and lower flows, θ_U and θ_L. Velocity increase at each transition will be

$$\Delta V_{Airspeed/transition} = \cos\theta_U V_{UpperWind} + \cos\theta_U V_{LowerWind}$$ [1]

1 Since velocity includes direction, one of those velocities will be defined by a minus sign. So technically we should take absolute value of the difference in the velocities. But this is an intuitive article. It's easier to just say, "+."

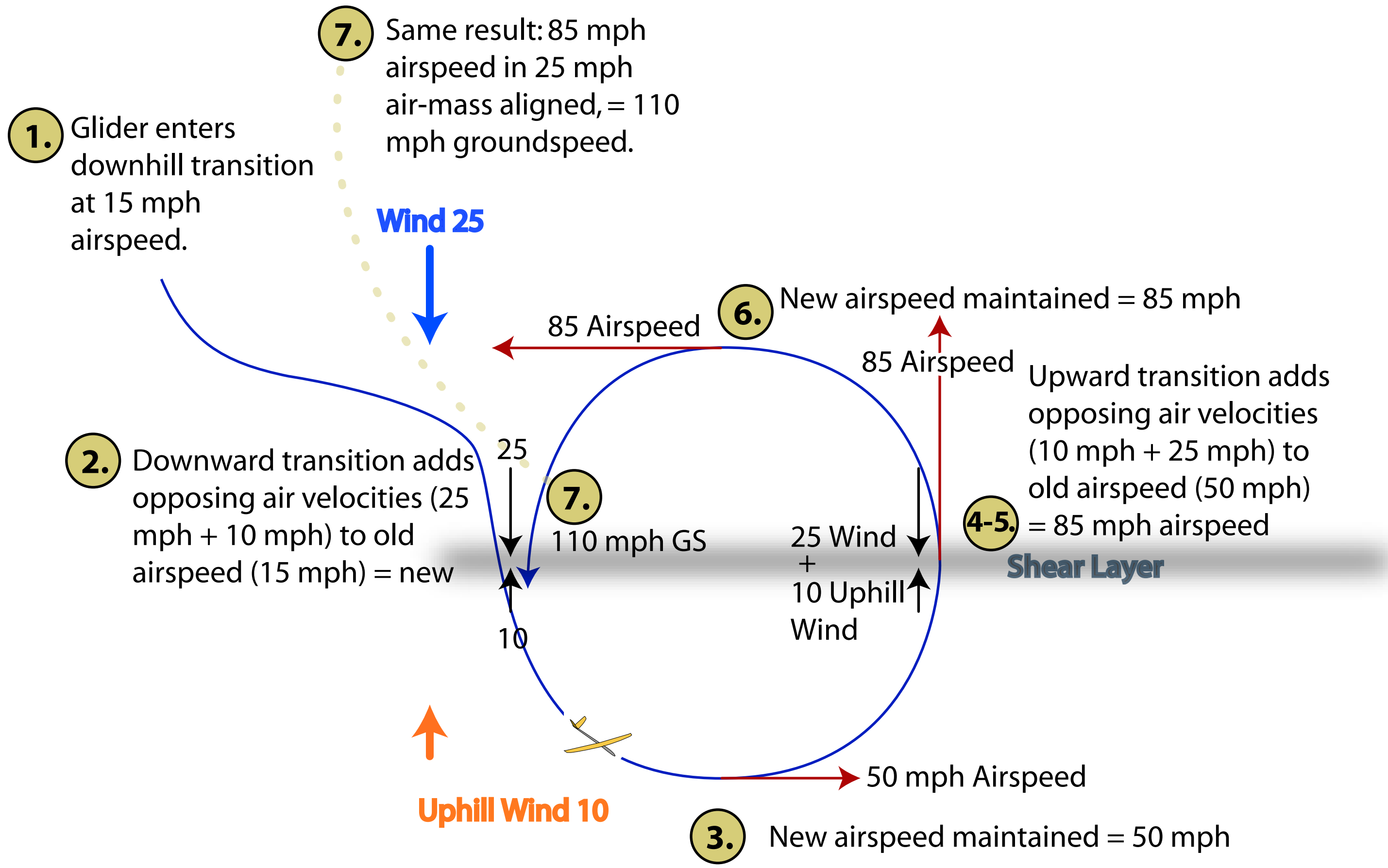


Figure 3-2 DS Arithmetic 2. The same increases in velocity, entirely from the airspeed perspective: Each shear transition bumps airspeed by the difference in wind velocities. Graphics by Alex Hart

θ#!, *Lb, N* Part 4

DS Forces: How a simple centripetal force has a component accelerating the glider along its ground path

DS Forces: Acceleration along a ground path

Allow two examples of acceleration across a flow.

1. Many years ago, downstream from the Ballard Locks, in Seattle, I watched a 45-foot ketch motor upstream to the right fence. The skipper hooked his aft (downstream) line first, but quickly unhooked it as the bow pivoted out into the current. When he bought us drinks, the skipper told us, “I thought I could just circle around and come upstream again.” That would have worked if he had very low water-speed. But because of the current, even though his sailboat had zero groundspeed, it had significant speed in relation to the water. He motored and turned. He never got beyond about 45° to the current. The keel moved him rapidly across stream. Six feet of bowsprit broke off, as it hit the fence on the north side of the waterway. I helped the guy get it through the locks.

2. When I was eighteen, I rode a small motorcycle north from Walla Walla, and crossed the Snake River at Lyons Ferry, when the ferry still existed. It was a cable ferry. A couple cars and my bike were the load. It had a cable harness that allowed the operator to adjust its angle to the current. That took us across the river.

These are exactly the forces on a model glider, during its quarter turn across the wind. Its angle to the wind both accelerates it across the wind and slows its upwind progress.

Ignoring drag, by the time it is belly-to-the-wind, its “cross-wind” speed is approximately its initial groundspeed plus the velocity of the wind. It also has downwind velocity approximately equal to the windspeed.

Forces, the easy way and the hard way

The hard way to think about the forces in a DS half-orbit is: Try to imagine the varying forces downwind and across the wind at the glider’s various angles of attack to the wind and differing upwind velocities in relation to the wind and the ground. This is approximately impossible.

The easy way is to just look at centripetal lift forces as the glider makes a fairly constant turn in relation to the air surrounding it. One way you can tell the forces are simple is that as you fly a DS circle, your control inputs are minimal. You just make small corrections, similar to coring a thermal. ’Til you blow it.

Forces are in relation to the air, not the ground

Think of a DS as like circling on a river in fog so thick you can’t see the banks. The current is like wind—we know these currents flow over ground or riverbed, but boats and gliders have no idea of this. Wind is only in relation to the ground, and gliders fly only in relation to air, turning as if on a river. The forces on your boat are drag, perhaps some propulsion, and a centripetal (center seeking) force that makes your boat circle.

At the confluence of a two rivers, or where you unwittingly turn into an eddy, your inertia will briefly insure that your velocity in relation to the water changes. These inertial forces have nothing to do with the riverbed, just as glider forces have nothing to do with the

Forces, from the ground perspective:

From the ground perspective, we imagine great forces on our model glider, based on what it does. We also have an idea of the wind.

The mystery: Our glider gains airspeed only as it punches up through the shear layer straight into oncoming wind. As it turns across the wind and then downwind, its airspeed diminishes with drag. But during this half-circle, its groundspeed increases by twice the oncoming wind's velocity. Where does this groundspeed transition come from?

The mystery restated: During this transition up into oncoming wind, groundspeed *diminishes* with drag. *Only as it turns across the wind does its groundspeed increase.* So there must be some pretty strong forces operating. Of course.

The forces that count are:

•First (and the one we care about, here), is the centripetal lift that makes the plane turn in its circle, in relation to the surrounding air. By convention, lift forces are defined as at right angles to air-path.

•Second, the force of the oncoming wind on the plane, or drag.

•Third, weight, gravity times mass. This cancels out, since the DS glider is at constant average altitude. It picks up a little speed going down, loses it going up, a wash.

Mystery restated again: Centripetal lift forces operate at right-angles to the glider's circular path within air. That's why it goes in a circle, in relation to the surrounding air. Forces at right angles to airspeed don't increase airspeed. How then do they increase groundspeed?

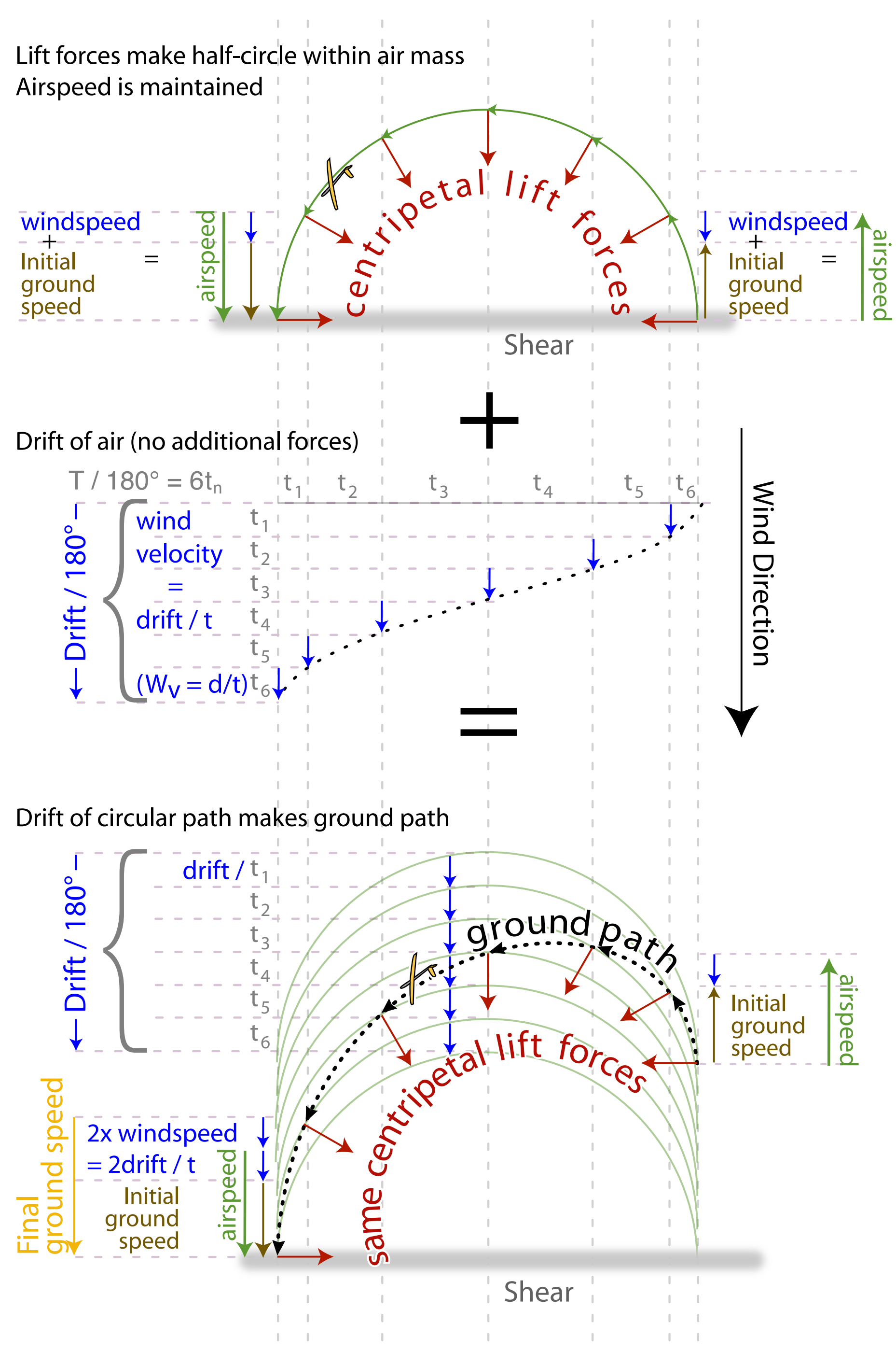
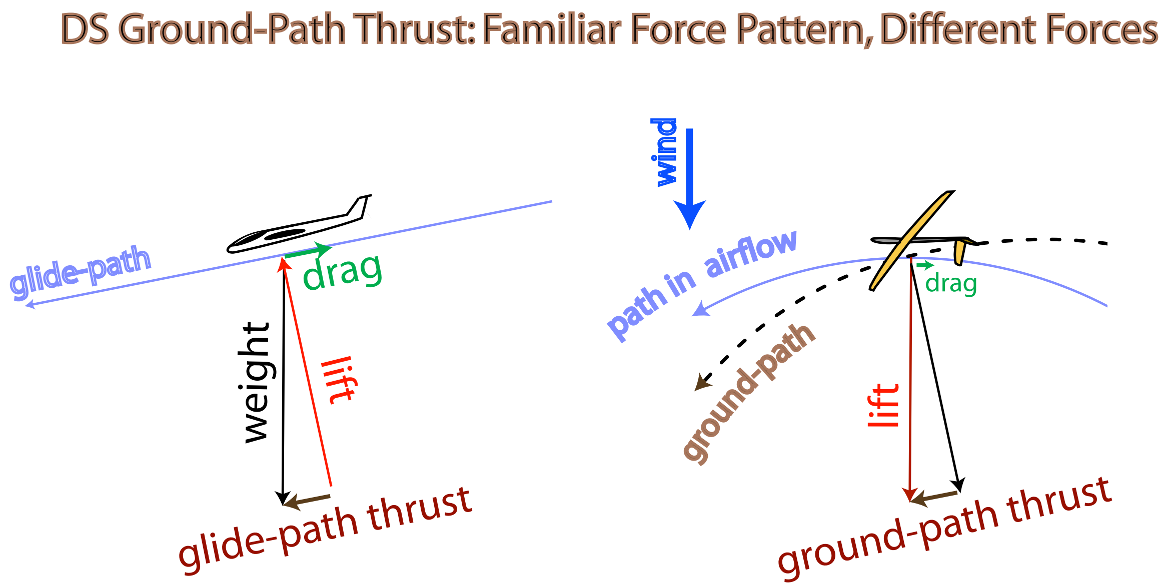


Figure 4-1 From the ground perspective: The notion of "wind forces" is a fallacy—the only forces are lift, drag, and weight. Centripetal lift forces make a semi-circular path within the surrounding air. But that air may be drifting in relation to the observer.
Graphics by Alex Hart



Glider thrust is the vector sum of lift and weight forces. Balanced forces make straight, unaccelerated path in air. (Side view)

DS thrust along ground-path is the component of lift parallel to ground-path. Unbalanced lift force makes curve. Drag < thrust makes acceleration. (View from above)

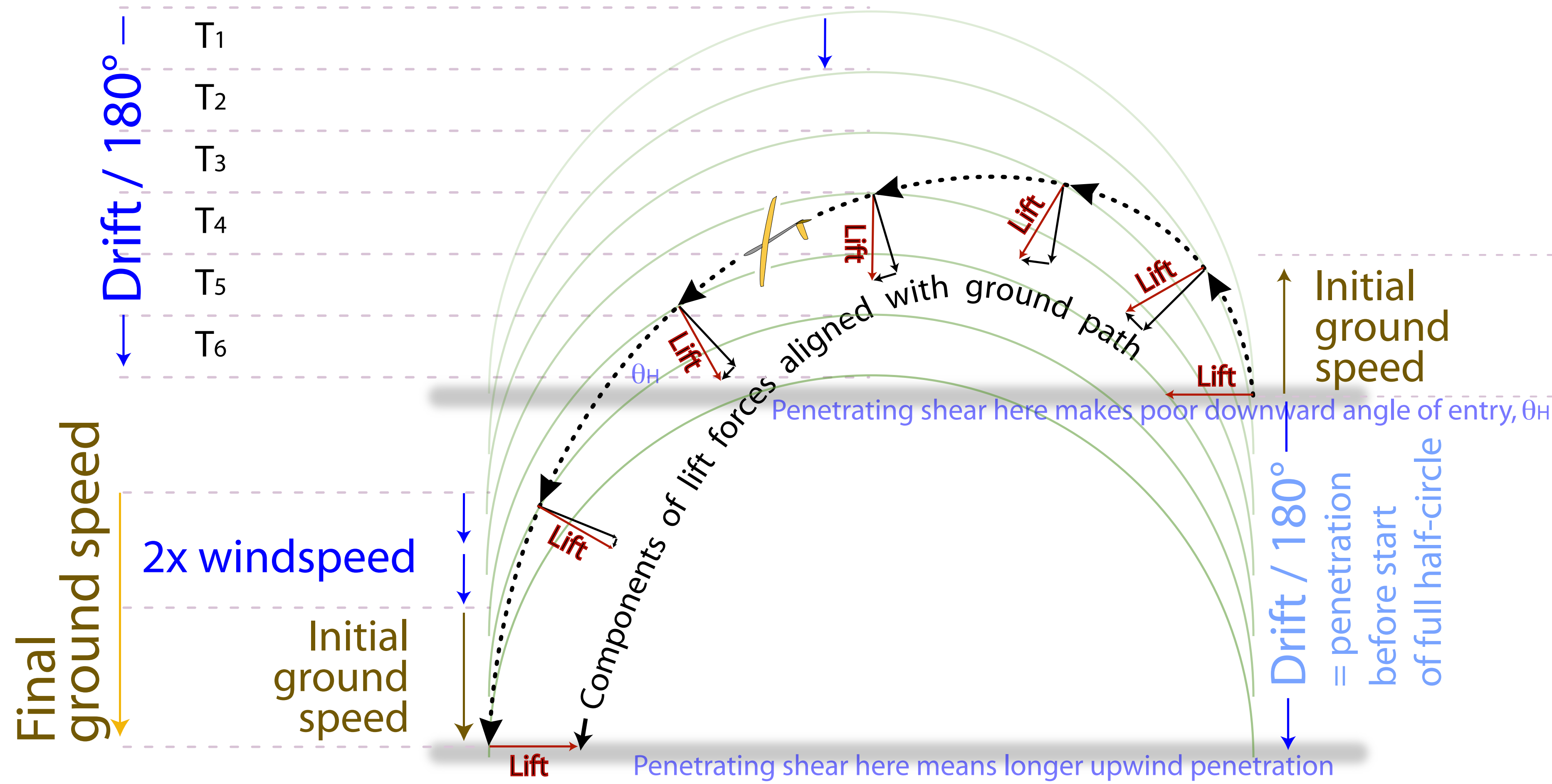
Figure 4-2
Different forces in similar, familiar patterns make DS groundpath thrust and glidepath thrust. Note that the DS glider orients to its flightpath within air (which happens to be moving), not to the ground. Graphics by Philip Randolph

Additional information—*Ground-path:* The resultant forces mean that the plane doesn't travel in a half circle, in relation to the ground. Its path is roughly the sum of the glider's movement along a half-circle, plus the half-circle's constant downwind velocity. We saw this last month, in the path of our marble. Like with our marble, as the model's velocity becomes increasingly greater than the wind velocity, it more closely approximates a circular ground-path.

Answer: The centripetal lift forces that are at right angles to the glider's circular path within air are not at right angles to its ground-path. Thus there is a component of these forces parallel to its ground-path which accelerates the glider along its ground-path. Hence its increase in groundspeed.

It's the same old force vectoring stuff we're used to: This is the same force vectoring stuff that accelerates a glider down its glide slope, just with a different force supplying thrust. On a glide slope, the force that counts is gravity. When the glider's path angles downward, a component of its weight is parallel to its air-path, providing thrust.

See Figures 4-1 to 4-4.



DS forces along glidepath. Penetrating the shear layer doesn't add ground-speed. Centripetal lift forces, in relation to the upper air's drift, don't add velocity or energy. They just make a circle in that air. But from a ground observer perspective, the model accelerates along its path, gaining energy in relation to the ground. How? Centripetal lift forces partly align with the ground path of the plane, continuously adding groundspeed.

It's popular, and probably optimal, to start the turn across the upper wind right at the shear. This makes a worse angle of entry downward, unless the pilot tightens his turn. Getting a perfect angle of entry downward comes at the cost of penetrating into the upper wind before starting the turn. Graphics by Alex Hart

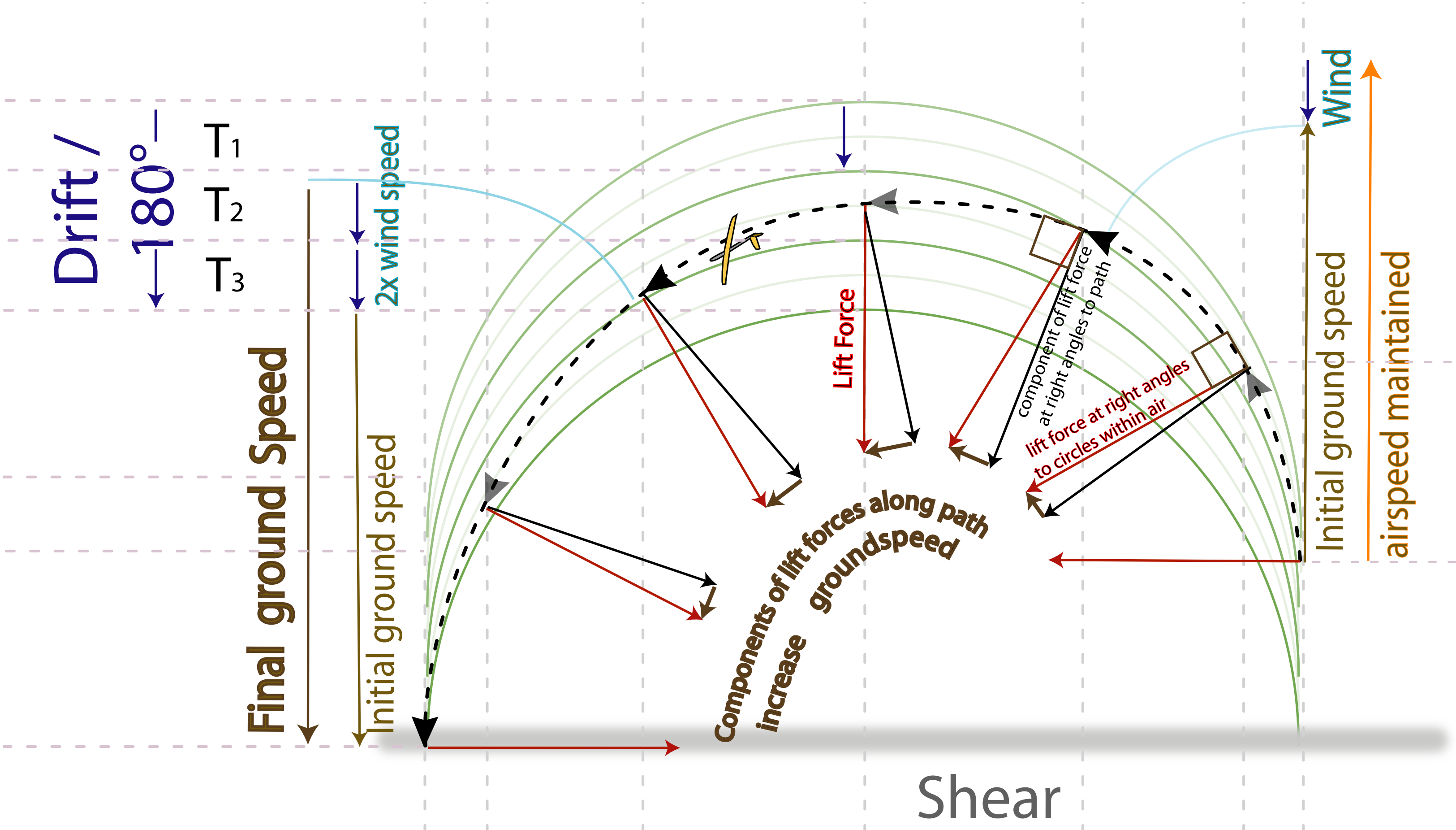


Figure 4-4 With doubled glider velocities, the groundpath is more circular—it doesn't drift as far. So the angles between groundpath and centripetal force, that make acceleration along the groundpath, are roughly halved. (The cosine is halfved) However, centripetal forces increase with the square of angular velocity, 4x. So the final groundspeed is still increased by twice the oncoming wind speed, less drag, per half-orbit. Graphics by Alex Hart, Philip Randolph

$\theta°$, cos θ, λ Part 5

A small wheelbarrow of additional pieces: Trig effects, trades of velocity for altitude, drag, ballast, and span loading

Punch into the teeth of the wind. Then use your new airspeed. Trig effects

The object is to minimize the angle of entry into oncoming wind, at each transition through the shear layer. That maximizes the glider's increase in airspeed, *relative to the flow it's entering, upper or lower.* That airspeed is what gets converted by the turn through oncoming air into groundspeed.

Why your glider sometimes gets so much more increase in groundspeed from a flow up the backside!

But there's a tradeoff. Behind a hill, lower, uphill flow and the upper, prevailing wind, are at some angle to each other. The plane of the DS circle is at some angle to these two flows. Tipping the DS plane flatter to the upper airflow angles it more sharply up from the lower, upslope airflow, and perhaps missing much or all of its velocity. And as the uphill rotor flow turns parallel to the upper airflow, it lessens the velocity difference between the two flows, there.

So the DS pilot has to pick which flow he wants to meet most directly. If there is an uphill flow hugging the slope, it's pretty easy to hit it head-on, but that means hitting the upper flow at a steeper angle. That doesn't get it optimal airspeed out of the upper flow, to convert via half-circle to groundspeed. And that makes the lower, uphill effect seem mysteriously powerful.

If there is little lower flow, a flatter DS circle will be more optimal.

See Figure 5-1.

Where's the maximum?

Here's where the "airspeed jump per shear layer transition" analysis makes things simple:

The maximum velocity change per circle will happen roughly *at the angle of the DS plane where there are the greatest total changes in airspeed when penetrating the shear layer.*

Repeated from above:

$$\Delta V_{Airspeed/transition} = \cos\,\theta_U V_{UpperWind} + \cos\,\theta_L V_{LowerWind}$$

The following section just repeats this one, but for groundspeed.

Maximum groundspeed changes per DS circle, for those who like equations

Only the component of the upper and lower winds parallel to the glidepath count.

The following equation, for the maximum velocity increase per DS circle, just says, "Find the DS plane angle at which velocity changes in shear transitions are greatest. Then vary the angle a bit to find the effects of drag."

$$\begin{aligned}\Delta V_{GMax}/360° &= \max\,(\Delta V_{GUpper}/180° + \Delta V_{GLower}/180°)\\ &= \max\,((\cos\theta_U\,(2V_{WindU}) - \Delta V_{DragU}/180°) +\\ &\quad(\cos\theta_U\,(2V_{WindL}) - \Delta V_{DragL}/180°))\end{aligned}$$

(Ignore that the angle of entry into oncoming wind is a combination of the angle of entry *across* the airflow (theta horizontal, θ_H) *and* the angle of the DS plane to the airflow (we could call that theta vertical, θ_V). That's covered next.)

Angling the DS plane flatter to one airflow usually angles it more sharply to the other

The angles of the DS plane to the upper and lower airflows, θ_U

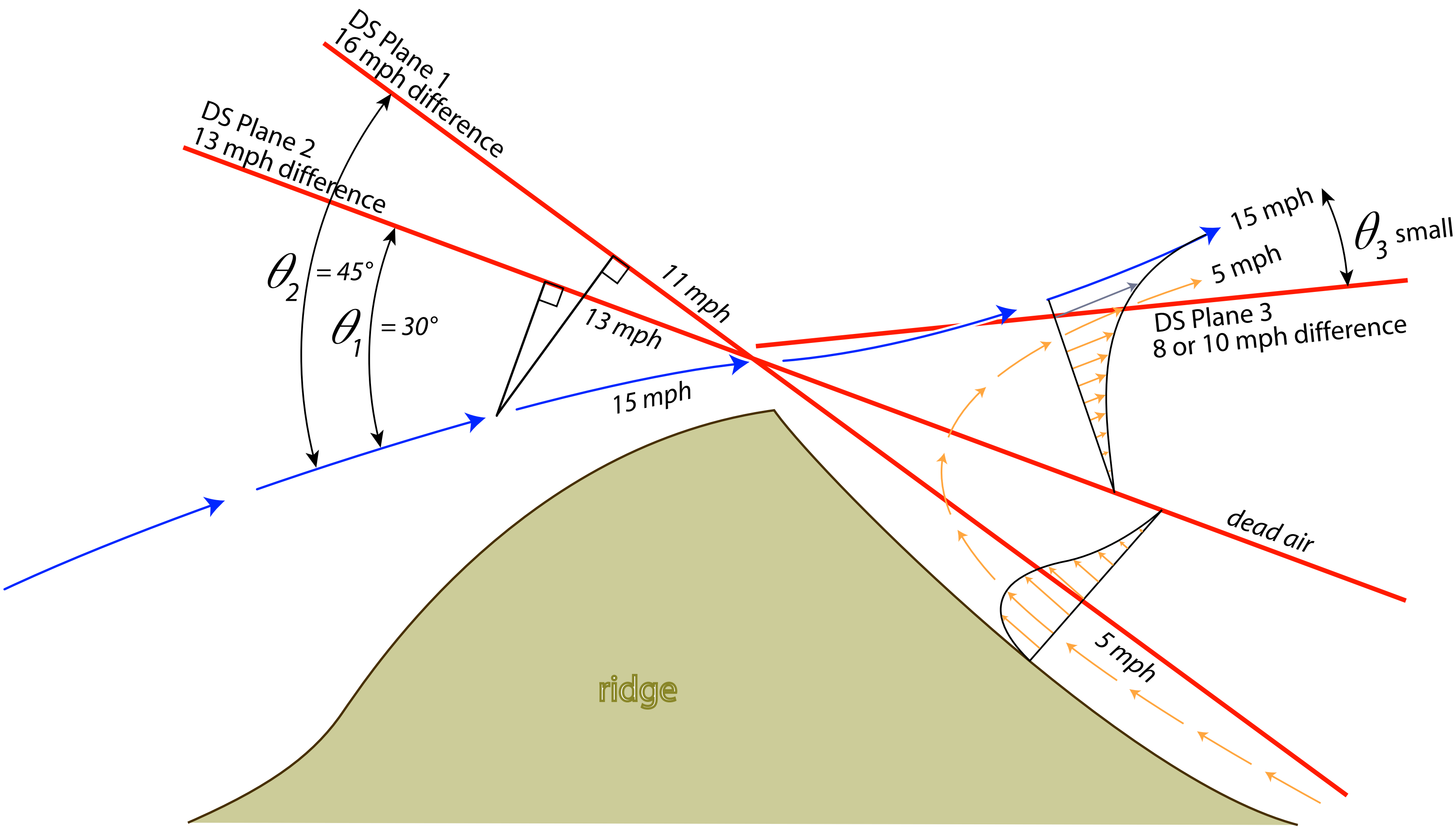


Figure 5-1 If there is a strong rotor or thermal up-slope flow, dive deep

and θ_L add up to the angle between the airflows, λ *(because lambda looks like the angles between two airflows)*. So we could substitute in $(\lambda - \theta_U)$ for θ_L. That repeats the idea that if you angle the DS plane flatter to one airflow, it usually angles more sharply to the other.

However, the lower airflow curves so much and has such gradients of velocity that any attempt to use such simple equations for field-precision is silly.

The moral: See what works.

Trig effects—adding the effects of angle of entry across the wind

The angle θ at which the model hits the oncoming air is a combination its angle across the oncoming air as it gets through the shear, and the angle of transition in a vertical plane.

Additions to airspeed at each shear transition will be the cosine of that angle times the speed of the oncoming air:

$$\Delta V_{Airspeed} = \cos\theta V_{Wind}$$

Losses to trig effects will be from not entering the upper (or lower) oncoming air head-on. This can be either from too steep a transition angle (an angle in the vertical plane), or a transition too early or late, so the model's velocity along its circle is now angled *across* the oncoming wind.

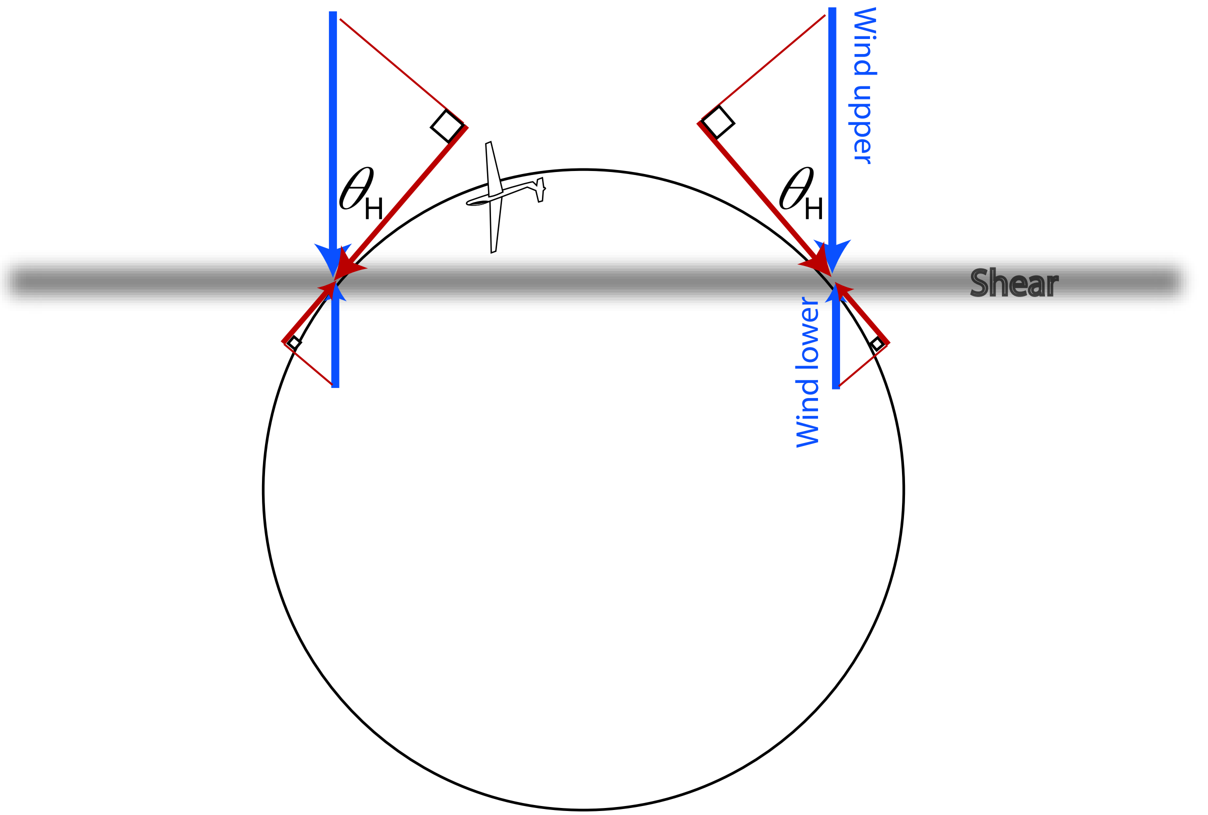


Figure 5-2 Theta horizontal—the angle of entry across the oncoming wind—ie., as viewed from above. When the transitions of the shear layer are not near the center of the DS circle, the angle across the wind, θ_H, lessens the bumps in airspeed (by cos θ_H) Graphics by Philip Randolph

The angle of entry across the wind will never be optimal across a thick shear layer. In this installment's opening photo, the sheer layer felt widened and scrambled by the basalt knuckles.

For the trigonometrically more fussy or capable than me:

Math jocks, call angles of entry in the vertical plane θ_V, and in the not quite horizontal DS plane. θ_H. θ is the angle to the wind of the vector sum of θ_V and θ_H. (**$\cos\theta = \cos\theta_V$** x $\cos\theta_H$.**)** For simplicity, in equations above we ignored the effects of θ_H.

See Figure 5-2

For Flyers: You'll feel what works

Flyers observe velocity increases, to find the optimal amount of that circle sticking up into the upper wind.

For flyers, what counts is to keep the penetration of the shear somewhere near the center of the DS circle, *in relation to the airflows.* That helps minimize angles of entry into the oncoming wind, both in the vertical plane and the DS plane, θ_V and θ_H. That's the last mention of the angle of entry across the wind, since with this rule, or seeing what works, it's fairly self-correcting,

Ground perspective will fool us. From the ground, the upper half-circle will look foreshortened when the wind velocity is high compared to the model's velocity.

But we're going to keep it simple. We're going to ignore the entry angle across the wind. Anyone who wants to be that accurate with trig effects will figure it out.

Philip, didn't you sort of ignore trades of velocity for altitude, in the inclined DS loop?

Yes. As a glider arcs upwards from shear layer penetration to the perigee of its circular orbit, it does lose airspeed. But it gets it back at about the downward transition point. Similarly, as it arcs down toward apogee, it gains velocity, but loses it on the way back up. If we were being fussy, we could note that the higher velocity towards the lowest point means higher drag down there. But mostly this is a wash, or dwarfed by other forces.

Drag, ballast, span loading

Drag, from penetrating upwind too far, versus a poor angle of entry downward, θ_H, from turning at shear penetration

Drag lowers as the glider slows in each half circle. Drag increases with each shear-transition, speed bump.

If you intuitively think there must be more energy lost to drag, or to something, when punching up into the airflow than when running downwind, or after punching down into dead air, you're right.

Review Figure 4-3. Note that since the ground-path isn't circular, we either have to lose speed to penetrating upwind before starting the turn across the wind (that makes more "wind feet" penetrated—I actually own a wind-feet meter), or we have to lose an optimal angle of entry downward, θ_H. Progressively tightening the turn is a possible compromise.

The greater the wind-speed compared to the glider speed, the further the drift per half circle, the more oblong the ground-path, and the more we have to compromise between optimal θ_H and avoiding excess penetration. Compare drifts in Figures 4-3 and 4-4.

At lower speeds (compared to wind velocities), where drag doesn't matter as much, penetration upwind before starting a full, "air-circle" is large, compared to the required penetration at high speeds, where drag counts more. That's a convoluted way to say, "Well, yes, technically, but who cares?"

Most flyers recommend turning immediately on penetrating up into a howling upper wind. That may mean having to penetrate less, but it also means a worse horizontal angle of entry, θ_H, and worse cos θ_H, when penetrating down. Remember, airspeed jumps are potentially the same down or up through the sheer.

So there's a tradeoff. The answer? Go fly.

Ballast

No matter how sleek, a very light glider won't penetrate at high speeds. Drag force, for a given shape, is a function of speed, as well as span loading. When that force gets applied to a very light mass, it decelerates it quickly. It loses velocity too fast to complete a half-turn. That's why if you could make a perfectly shaped glider out of inflated Mylar film, rather than DSing well, it would just blow away. Some DS screamers have wing loadings of over fifty ounces per square foot.

Choice of airfoil—Max C_L vs. thin, low drag foils, and rigidity

A DS airfoil has to have torsional rigidity, or it will lose its C_L (coefficient of lift) as it twists. That's easier to accomplish with thicker airfoils or composites. It needs low absolute drag at high speeds, which at first implies a thin foil with low camber. But it also needs a good C_L max to stay well away from the high drags near stall. That requires some camber. It needs fairly high lift to drag (L/D) at high speeds, so it doesn't mush through its continuous turn.

This sort of optimization is for the guys who like to crunch polars, multi-variable graphs of airfoil and planform performance.

Span loading

If you like getting technical, though, drag related to lift is inversely proportional to span loading (and not aspect ratio—that's related to coefficient of drag, C_D, which only gives absolute drag when multiplied by wing area). Lift drag (vortex drag) counts in the high gee turns of DS. That's why the speed record is held by a 100" model instead of a 60" model. Heavy models with long wings DS fast.

One more time through the concept

Sometimes finding another way to plow through a concept helps. We'll see how a plane DSing between two wind currents gains velocity in the same (physics) manner that a ping-pong ball gains velocity as it is batted back and forth by two bellicose blowhards.

θ = | ° | Part 6

DS and ping-pong elastic collisions. Velocity increases are similar in DS and Ping-Pong. A glider's turning rebound from oncoming air is a highly elastic collision, similar to the elastic collision of a ball with a paddle. Analogy, arithmetic, and physics

The analogy: A plane DSing is like a ping-pong ball getting knocked back and forth, faster and faster

If two ping-pong players hold their paddles still, such that a ball bounces between them, the ping-pong ball rapidly loses energy and falls to the floor.

That's pretty much like a model glider (with high initial velocity) trying to circle at constant elevation in dead air. In each half circle, the model retains much of its speed and reverses its velocity. Even a glider with great energy retention eventually loses so much speed it has to nose down.

But: If the ping-pong players act like they usually do, and push their paddles toward each other to hit the ball, *we'll see that each adds double the velocity of their paddle to the ball's rebound.* The ball gets going faster and faster between them, 'til it hits some terminal velocity determined by air friction.

The faster a ball goes over the net, the faster it comes back. I used to do a fairly fast serve. When a buddy could return it, it would come back too fast for me to hit, but if I did hit it back, it would be really streaking.

This is much like a model sailplane "bouncing" between layers of air with opposing velocities. A model airplane "bounces" off an opposing air current by performing a steeply banked turn, in which it retains most of its airspeed. At each half-circle, each opposing air current adds double its own velocity to the glider's groundspeed, less losses, which can be large.

The arithmetic: Model glider and ping-pong ball velocity increases add in exactly the same way

When a ping-pong ball hits a stationary paddle, it bounces back with nearly its original velocity.

When a ball hits an oncoming paddle, its incoming velocity *relative to the paddle* is the sum of their velocities. If the ball is moving at 10 fps, and the paddle is moving at 15 fps, the ball's incoming velocity *relative to the paddle* is 25 fps. It bounces with most of its 25 fps incoming velocity *relative to the paddle,* plus the velocity of the paddle, 15 fps, making 40 fps!

May you θ that fast

The speed increase is (nearly) twice the velocity of the paddle!

Actually, it loses a bit of velocity to internal frictions, loses a tiny bit of energy to the paddle, and loses more to air frictions, as it flies over the net.

When a model glider hits oncoming air, its velocity *relative to the air* is the sum of their velocities. If the glider has groundspeed of 10 mph, and it punches down into air moving up 15 mph, the glider's airspeed (relative to the oncoming air) is 25 mph. It carves its half-circle turn retaining its *airspeed* of 25 mph within (in relation to) air going about the same direction at 15 mph, making 40 mph! (Less losses).

The glider's speed increase is (nearly) twice the velocity of the oncoming air.

Physics: Elastic Collisions

For a ping-pong ball and a model airplane, it's about the same physics.

A ping-pong ball bounces off the comparatively huge mass of a paddle in a fairly elastic collision, which means it retains most of its velocity. To this is added the velocity of the paddle.

A model airplane "bounces" via a carved, 180° turn, off a comparatively huge mass of air, in what amounts to a similarly quite elastic collision, meaning, it retains most of its airspeed relative to the oncoming air, which is now moving in the same direction.

In a somewhat *in*elastic collision, like trying to bounce a barely inflated basketball, energy is lost to internal frictions. As glider speeds become extreme, drag takes over. Then the "bounce" off oncoming air is less elastic. More energy is lost to frictions and turbulence.

May you θ that fast. ■

Rooting for the Tulip City Air Force

HSWT makes its third trip to Saugatuck/Holland Michigan

Tom Nagel, tomnagel@iwaynet.net

This June my extended family made its third annual trip to the Saugatuck Michigan area. Three nice cities cluster together there: Saugatuck, Douglas and Holland. I have good news and bad news.

First the bad news: The combination Dairy Queen–Gun Store in Saugatuck is no more. It is now a pedestrian Dairy Queen–Visitor Center. Folks just don't value their cultural landmarks like they used to.

Now the good news:

1. The area is still a great place to visit for a family vacation.

2. All of our old favorite eateries are still there, and we found a few new favorites.

3. Holland MI is the home of the Tulip City Air Force, an active and well set-up RC flying club.

4. And best of all, the area boasts the finest slope-flying site I have seen in several years. Details follow.

After my 2006 vacation article on Saugatuck I received an email from RC sailplaner Larry Weller, who lives in Douglas MI and helps his wife run her art gallery in Holland MI. Larry had just recently returned to the hobby and was flying thermal sailplanes with the local power club, the Tulip City Air Force. The TCAF has a nicely set up field east of downtown, with a parking lot, shelter house, starting tables, safety fencing and a manicured grass runway. There is even a good size pond adjacent to the field for float flyers.

TCAF has about 70 members, and I met three of them: Larry himself, Bix Norman a newly enthused sailplaner, and Bob Harvey, the owner of Cobblestone Hobbies, Holland's downtown full service hobby shop. Bob has owned and run the business since he was 19 years old, back in 1973. Cobblestone is the only hobby shop I have ever seen that has as its centerpiece a full-scale ultralight aircraft, hanging from the ceiling like some sort of RC plane with a thyroid problem.

After my 2006 article, Larry had gotten interested in sloping and had started scouting for locations. He found a doozie.

Left: Cobblestone Hobbies, Holland's downtown full service hobby shop. Right: Cobblestone is the only hobby shop I have ever seen that has as its centerpiece a full-scale ultralight aircraft

Laketown Township Beach Park (apparently named by the Michigan Department of Redundancy Department) is located on the shores of Lake Michigan about halfway between Holland and Saugatuck, but is so poorly marked by signs that you need to be a local to ever find out about it. I had missed it in two years of scouting by road and by map.

In order to get from the small but adequate parking lot to the gorgeous beach, one has to climb 145 stairs up to the ridge top, and then descend 200 stairs to the beach. Some OCD sun-worshipper has thoughtfully inscribed "100" at the one hundred step level. And the township has thoughtfully installed gasping benches every 50 or 60 steps for the benefit of old farts like me.

The 145 stair steps up and the 200 stair steps back from the beach probably help keep beach traffic under control. (Hint: sailplaners only need to do about half of those steps, on a good day.) Larry and I were there on a Friday afternoon in late June. Beach traffic on the stairs was light. I would not have worried about flying a combat wing or other foamie from any of the gasping bench platforms.

At the 145 step level the stairway crests the shoulder of the dune, and a bowl shaped slope opens on the left. It looked

Left: Larry Weller and his Ridge Hawk. Not much left of the original except for the plastic fuselage. Larry installed a brushless motor and lipos, and scratch built new wings and tail using Compufoil. Right: Bix Norman at the TCAF field.

to me as if the bowl would be flyable on winds from southwest to northwest. The steps cross the right shoulder of the dune, and total slope height appears to be about two hundred feet as I read the topo map.

There is an even better looking slope at Green Mountain Beach, just about a half mile north along the beach, but it is on private property, and there is no easy way to the ridge top. Call Larry. He can tell you how to sneak in. Or get a friend with a power boat to take you and your electric sailplane to Green Mountain Beach.

Back at Laketown Beach, out in front the waves were crashing into the shoreline. Larry looked back to see what the splashing sound behind him was. It was me salivating on the boardwalk.

Unfortunately, my luck was holding, and I had run out of wife-allocated sailplane time for the trip. I had spent my sailplane afternoon flying thermal at the TCAF field, while my wife spent her mad money at Larry's art gallery. I wonder who will be the first to report back after sloping this lovely site?

IF YOU GO:

Laketown Township Beach Park is a public beach. Folks will be coming

Left: A small part of the bowl at Laketown Township slope. Right: The view down the slope—check out the steps off to the right for perspective on the width and height of this slope

up and down the stairs during beach season. Clearly, it is safer to plan on flying here in the spring and fall, or on non-holiday week days.

This is a township park, so there is no admission fee, unlike the Michigan State Parks. There are also no State Park Rangers. Signs urge you to stay off the dune grass, but trails indicate that not everyone does. Use good sense if you need to go off the stairway.

Late in the afternoon, Larry and I found a flyable westerly breeze on a day that had featured brisk easterly winds. Lesson: late in the day onshore breezes may make this site flyable irrespective of prevailing winds inland.

Laketown Township Beach Park is located (appropriately) on the shores of Lake Michigan at the west end or 142nd Ave, about halfway between Holland and Saugatuck.

From Holland go south on state route 146; from Saugatuck go north on state route 146 (which is also 64th Street) and turn west on 142nd Avenue and follow it west to the end.

Try not to salivate. It makes the steps slippery.

Above: The first 50 or so steps up to the Laketown Township Beach slope.

Upper right: The Laketown Township slope. It looks deceptively tiny in this photo somehow. The dune is probably over 200 feet tall and a lot wider than it is tall.

Right: Steps and Gasping Benches. Unlike Sleeping Bear, this slope has a safe area in which to land at its base, and also a way to get back up to the crest if you have to go down after a plane. Plus young ladies in bikinis.

A totally non-sailplane related picture, but totally Michigan-related weirdness. This car, parked near our cottage, almost made up for the loss of the Dairy Queen-Gun Store.

Essential Websites and Joints:

info@saugatuckdouglas.com for all your touristing needs

Harbor Duck www.harborduck.com Lots of fun if you are feeling amphibious or want to get ducked while on vacation.

Chequers of Saugatuck—a quaint English Pub at 200 Culver Street, Saugatuck.

Wally's Bar—Saugautuck, outdoor patio, burgers and beer with an ultralight hung in the ceiling.

Saugatuck Brewing Co. 2948 Blue Star Highway, Douglas MI. www.sbrewing.com, the home of Oval Beach Blond Ale.

Moynihan Gallery, Larry Weller's day job, 28 East 8th St., Holland MI. www.moynihangallery.com

Cobblestone Crafts & Hobby, 210 Central Avenue, Holland, MI 49423.
Phone 616-396-3029 -- in case you break something, or need a place to hang out while your wife is shopping at the Moynihan Gallery.

UNCLE SYDNEY'S GOSSIP COLUMN

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

Uncle Sydney and his new Supra

Dateline: Early June 2007

Weather rules: not OK!

Don't talk about the English weather, far too boring and specifically designed to frustrate soaring. End of May and we Brits haven't had one round yet. Meanwhile Contest Eurotour has had five competitions - Istanbul in Turkey, Forli in Italy, Holic in Slovakia, Ludwigsfelde in Germany and Osijek in Croatia. And it is already won for 2007 by - guess who - Philip Kolb!

Still mathematically possible, just about, that someone could beat Philip because the European league consists of 13 contests and each pilot's three best scores count. But Philip has already notched up 308.75 points after dropping his 102 scored in Istanbul. Sebastian Feigl is in second place 3.58 points behind, with his brother Benedikt a further three points behind in third place.

For those unfamiliar, how can any pilot score more than 100% in any contest? If you win top place in a fly-off, then you score three extra points to add to your total in the preliminary rounds, second place add two extra points, etc etc. This system will be used here in the UK F3J league for the first time this year, if and when we actually fly a contest and fit in a fly-off! The idea is to reward top flyers who do well in 15 minute slots, competing directly with the best of the bunch.

Returning to Philip, he left it until the last competition in September to win last year's Eurotour in Bled, Slovenia. Quite unreasonably, he has ruined this year's league with less than half complete. For the record, Philip has topped the Eurotour six times so far: 1999, 2001, 2003, 2004, 2005 and 2006. "That's enough," I hear you say. "Give somebody else a chance!"

This gossip column is not only about winners. My favourite competitor in this year's Eurotour is Esra Koc, daughter of Turkey's F3J maestro Mustafa Koc. Father is currently placed fifth in the Eurotour, while Esra, competing seriously for the first time this year, she has flown in four contests. Best score so far was 76.16 at Forli, and she is currently 58th place in the league. Esra is 10 years old!

I first met Esra and her sister, who is four years younger, in Istanbul when introduced by her mother four years ago. She wasn't flying then, but she was already dad's keenest supporter. Now she tells me she's flying the Eva and a Space Pro - "I don't build my own models, but when my models break, if it's not so bad, then I fix them myself. I want to learn how to build models."

Esra has already qualified for the Turkey's junior team and will fly in the European championships in Trnava this August. She also hopes to compete next year in the World Championships - in Turkey, of course! I shall follow her progress closely and I'm taking bets on how long it is before she starts beating dad.

Kiwis attract globe trotters

Moving across the F3J world to both the United States of America and New Zealand, RC Soaring Digest has carried reports of Joe Wurts winning February's Kiwi SoarFest in Matamata, two hours drive from Auckland. Another F3J star, Carl Strautins from Australia, was also there to hot up the competition, along with old friend Sven Zaalberg, who flew for UK in Red Deer 2004 and has since returned home as a captain with Air New Zealand.

It's been an ill-kept secret for some years that Joe and his wife Jan were keen to emigrate to New Zealand, a country they've learned to love since their first visit in 1994. That was the year Joe had a demonstration tour of the country, invited by keen F3B flyers who wanted first hand experience of how the experts do it. Joe and Jan returned several times and in 2004 applied for residents' visas, a contorted and testing process which was only completed this year. Joe retired early from Lockheed and has set up his own engineering consultancy business They've sold their house, and as soon as their new labrador puppy Lonnie has all his permits and jabs, they'll move in the summer.

What I have yet to discover is how long it will take before

Joe Wurts with his Supra and Australian Carl Strautins with fingers twitching returning to the pits at New Zealand's 2007 SoarFest held just outside Auckland.

Joe is eligible to fly for New Zealand, rumoured to be three years. My spies tell me he will be invited to manage the Kiwi team in 2008. Confirmed is that six senior pilots are competing for next year's national team, one of whom is Sven, to be decided in October.

Joe Wurts is the only thermal pilot I know with a record of success which surpasses that of Philip Kolb. (I'm sure that Philip would be first to go along with that!) America's loss with Joe's departure will be more than compensated for by New Zealand's gain.

What makes a good F3J model.

Everyone has their favourite model, often the latest "pride and joy". We also have our most nostalgic model, that sailplane which would still win slots if only it still existed. Or the one which you took out late summers' evenings and it just refused to come down as the sun set.

The pace of development of F3J models seems to have slowed somewhat, although none of today's top frequent winners were around five years ago. I'm thinking of the Pike Perfect, Xperience Pro or Shadow, Aspire, Vision, Espada or Supra. The characteristics of top models have changed too. All of them seem to zoom off the top of the line with more energy to convert into height. Spans have increased typically by 0.5 metre.

Are they easier to fly? My answer to that is mixed. I've had about a dozen flights with my new Supra in the past week and it really is the easiest F3J model to fly that I remember. It nestles into thermal turns and barely needs any correction - as close to flying itself as one would wish. Whether that translates into better scores, we shall see.

What really irks me is when the reviewer has an F3J duration machine and he details his experiences flying it on a slope.

My previous 'new' model, now well into its second year, an Espada, is always full of surprises. I've flown it sometimes and been amazed by its duration abilities. Yet other days, I could have happily given it away as it came down in kind air twice as fast as anyone else. And I thought I could trim!

Recent questions from a friend who shall be nameless raised fresh thoughts in my mind. He's been flying an Esprit for many years, often with success, and he's wondering what to buy and fly next. "Nothing too slippery," he says. For instance, he finds a Starlight 3000 he's tried tricky. He wants to go back to the SD 7037 aerofoil and is willing to trade competitiveness for handling comfort.

Time was when you could get a reasonable guide from model magazine reviews. Nowadays, you get a few pics and words on what's been fitted and how long it took to assemble: little more. What really irks me is when the reviewer has an F3J duration machine and he details his experiences flying it on a slope. Or you see pics on how he's linked his servos and you know you stopped that years ago because they were too sloppy.

My friend wants help and he's right that there is little available guidance. So drop a line to the Soarer or post your comments and opinions of your latest winner, good and bad, on the new BARCS web-site.

In praise of Elapor

With the scarcity of gossip so far this year, let me sing the praises of Multiplex and what they are doing with Elapor, their fancy name for EPP. Many pilots will remember the fun they had with Twinstar a few years ago. This chunky electric airliner with a 400 motor on each wing could fly almost anywhere, control-line races without lines, combat with or without streamers, and fitted with lights you could fly it after midnight around campsites.

Nearly three years ago Multiplex launched the EasyGlider, 1.8 metre span, pure glider or 400 electric, advertised as a recruiting tool to persuade power modellers to take up thermal soaring. I bought one early on, carried everywhere, and flew it whenever the opportunity cropped up. It was almost uncrashable and I didn't hesitate to let anyone around have a go. No model has given more fun per Euro than that. And another clubmate is flying it today.

Two months ago, Multiplex went one step better and launched Cularis, again pure glider or electric, this time with a span of 2.61 metres. Again it is quite chunky due to the nature of the Elapor, but it looks semi-scale and it has a four servo wing with crow-braking. It flies well if a little fast and again is easy fun.

But what sold me and fascinates me is how the Multiplex designers have coped with the structural problems of achieving a high aspect ratio wing out of what is simply uncovered plastic foam.

The kit costs £110 from West London Models and is full of innovative and intricate white nylon components, plus foam jig to assemble the wing panels. The two-piece wing, each with two mini servos for flap and aileron, plugs straight into the fuselage and a moulded fitting holds the wing joiners and the servo leads, plus a catch to lock each wing in place. The all-moving tailplane has a special fitting which also locks the two halves in place on each side of the fin. Assembly and dismantling takes seconds.

If Multiplex continue to develop this material and approach to gliding, it will not be long before they have high performance gliders at low cost which will surely help to entice tyro pilots to fly competitively.

Elapor leaves a few queries. For example, I wonder whether or not to spend a couple of hours using wet and dry paper to sand off the little bobbles on the moulded surfaces, part of the production process. The trailing edges of the flying surfaces are 3-4 mm thick rather than the knife-edge which we're used to with glass-fibre models. Typically I spend £30-40 each for wing servos, but Cularis has the cheaper £6-8 mini servos. How much difference does that make? Not a lot apparently.

I've no way of accurately measuring glide angles and sinking speeds, but I do know that the previous EasyGlider had a rate of descent about twice that of my F3J machines. That simply meant that you had to find stronger thermals to go up, and it was all the more obvious when you found one in marginal conditions. Cularis has not flown much so far, but I guess that its still-air sinking speed is about two-thirds that of a normal F3J model, 0.5-0.6 metres/second.

The EasyGlider fitted with a 2000 mAh two-cell Lipo had a power run of 30 minutes and it was easy enough to fly for 90 minutes if you chose, more likely several flights over a long afternoon. With a 1500 mAh three-cell Lipo in the Cularis, you get about six power runs up to 200 metre height. It thermals fast and well, but watch for tip stalls if you set the CG back.

Multiplex plus Elapor are more than likely to boost the popularity of thermal flying and deserve high praise.

End of gossip for now! ■

Mud & Mayhem

the 2007 Western Colorado Slope Challenge

by Gregory Luck and Paul Arbogast, with additional photography by Dawson Henderson

Prelude:

"A trough of low pressure will be centered over the forecast region through the weekend, bringing unseasonably cold temperatures with scattered rain showers and snow likely..."

The weather report was painting a bleak picture for a weekend of Slope Combat. The Western Colorado Slope Challenge in Montrose Colorado generally features a healthy dose of dust and heat. But the 31 pilots arriving from all over Colorado, plus Arizona and New Mexico, were prepared for the anything that Colorado weather can bring. On Flat Top on Friday evening, the day before the event, the slope was lined with guys in boots, warm coats, winter hats and gloves. They had come to fly. To fly combat. And they were not going to let a little weather get in the way of the fun.

Wind was light out of the south and a couple gliders were floating in it. Just before day's end, the wind kicked up hard. Suddenly the air was filled with wings flying a fast figure-eight pattern and stabbing relentlessly at each other. A spatter of rain blew in on the wind while the setting sun dropped under the clouds and lit the bright wings against the stormy sky. For a few minutes there was as much rain as wind, which sent most of the pilots to their cars and back down the hill. The few pilots who stayed found some smooth lift after the rain as darkness closed in. Dawson Henderson had his aerobatic LEG Guppy swimming in the moist air, and Andrew "The Canuck" Williams pulled out his LED-lit Lumberjack and carved lines over the lights of Montrose.

Background:

The Western Colorado Slope Challenge (WCSC) started out as a small idea among a few slope fliers in Montrose Colorado. Michael Thompson, Dale O'Donnel, Jim Ferguson and Paul Arbogast got together one day in Michael's workshop. They worked out the details for what they hoped would be a fun event that would long be remembered by those in attendance. Three years later and it has grown into a premiere combat event for many Colorado slope fliers. This years event was held on May 5th and 6th.

Late on Day One, after the wet snowstorm. Photo by Gregory Luck

Flat Top is a 400-foot high pile of sediment with a broad table-top and steep, eroded sides of pale dirt. It's an excellent site for a slope event in a location with no consistent prevailing wind: there are flyable faces for every direction. And it's only three miles from the center of Montrose and all the amenities of a small fast-growing city. The lower elevations of Western Colorado feature plenty of sunshine, low moisture, and very little shade. But this year, after a wet winter and a wet spring, Flat Top and the surrounding mud hills were bristling with an unfamiliar green and punctuated with colorful desert blossoms. And with the weekend forecast calling for more moisture...

Day Two, Dynamic Soaring (DS) Combat on Spinal Tap Ridge, near Delta, Colorado. Photo by Gregory Luck

Group shot of the combatants on Sunday at the end of competition. Weapon of choice for pilots: Modified Windrider Bee, upgrades available from www.predatorwings.com. Photo by Gregory Luck

Day One:

Saturday started out cloudy but dry. A conga line of cars and trucks weaved up the steep dirt road that clings to the edge and climbs to the top. After a little "warm up" with light planes and some electrics, and a brief pilots meeting, the Combat began. A bit feebly at first, but soon the wind was light and cycling out of the north/northwest. At times there were 30 wings in the air, and at times there were 30 wings falling out of the air.

When the lift was good, there was a bewildering pattern of brightly colored wings flying together in formation like a school of fish. Most pilots were making good use of what might currently be called the "Colorado Style" of combat: A semi-defined, but always changing "course" consisting of a flat figure-eight at about horizon height. Pilots synching with each other and suddenly pouncing when the whirl of activity put them at an advantage. Mixed in with planes flying the course backwards, planes diving through the thick part of the swarm, and the mayhem that would ensue from either missed attacks or from the loud and frequent SMACK of gliders colliding, each pilot vying to pound another glider to the ground without ending up there himself. "Sign my card!" was the battle cry of the victorious.

When the lift tapered off, the swarm would suddenly disburse. Most pilots would run their gliders for the edge of the slope, trying to save themselves a hike down the hill. Others would range out in search of lift. Some would find it, and

Above: Cody Remington displays his DS skill with his F3J Espada on Spinal Tap Ridge. Photo by Gregory Luck

Right: Cody Remington launches his Espada into the light frontside lift. Photo by Dawson Henderson linger until the next cycle. Others would range out and down and down and down, aiming for the switchbacks below, where a team of friendly and helpful quad riders would gather wings and motor them back to the waiting pilots on top.

Overall, the flying was good and the combat was intense. In a swarm of thirty planes, even keeping track of one's own plane was occasionally a feat of hyper-concentration. And when there was a pile-up of four or five planes at once, it often became impossible to pick out your own plane until too late. SMACK into the ground, and you'd be signing another pilot's card. Verbal taunts and jabs filled the soundtrack, and frequent peals of laughter. Everyone was flying and grinning.

Shortly before noon, the north wind dropped away. A few minutes after that, it picked up from the south. Light at first, then quickly growing into a frenzy of strong, gusty wind. Within moments most of the pilots had dashed the 30 yards across Flat Top and were lined up facing the grey wall of an approaching rain squall.

Combat was fast and furious, with gliders being hit and pounded into the dirt, or thrown high overhead by the big lift. The shouts and laughter got louder to overcome the sound of the wind. The combat leaders were racking up point after point. But it was all over quickly. The rain blew in, everyone loaded their planes, and the conga line of cars and trucks danced down the steep dirt road before the mud got too slippery.

Day One, Part Two:

The point of retreat was the lair of Michael "the Artmonster" Thompson. He graciously opened his yard and shop to the crowd of muddy pilots. Everyone settled in, and soon the BS was flying as fast and furiously as the combat planes had been. Lunch was served under his wide carport. Stories of the morning session were told and re-told. Knots of guys were stooping over planes laid out on Michael's well-equipped bench, fixing that which needed fixing, and modifying that which may or may not have needed modifying.

The rain turned to snow which fell thick and wet, but didn't stick to the lawn. Eventually it stopped. A couple guys ventured out and called from Flat Top to say that it was a little muddy, but not bad. Back we all went. Across and out of town, and another conga line up the muddy road. The mud on top wasn't too bad. But did have a tendency to make people a little taller with each step as it piled up on the bottoms of boots.

The wind was very light. Wings were flying against a grey sky over a backdrop of now-snowcapped hills. Then even the light wind faded away. Out came the electrics. Some 3-D flying by Cody Wilson and Dawson. And Ian Frechette tore up the sky with his 3-meter electric Trinity – which was the biggest "park flyer" that most of us had ever seen.

This fun didn't last long. The rain came back, this time without the leading burst of wind. Everyone scrambled for the vehicles again. With fresh rain falling on the peculiar mud of the already wet road, things got slick fast. No more conga. Instead it became an Anaconda Line of cars and trucks, slithering and squirming through the ooze, coming dangerously close to sliding though the tight coils of the turns and plummeting off the edge.

Back at Michael's, the conversation was filled with mud-spattered tales of How I Managed to Get Off Flat Top. And the usual tales of flying and planes. Dale and Rob Duncan had pre-smoked several briskets, and Dales wife Tonia and mother-in-law Lisa finished the prep work on those as well as lots of other food for the BBQ (as well as the Saturday and Sunday lunches). If Colorado slope fliers can't be on the hill flying, then they like to eat, which is what we did.

Around the prize table during dinner there were a number of discussions about who was going to win what. After dessert the WCSC raffle began, and the truth was in the ticket. Again this year there were many great sponsors. Three of the prizes were brand new, never before available to the public: The

Weapon of Choice for the WCSC

Every pilot present had at least one Predator-style Bee.

This is a Windrider molded EPP foam kit modified and improved by pilots over the years and sold with all the upgrades and excellent instructions by one of the innovators, Karl Decker of www.predatorwings.com.

Upgrades include replacing the spar with an over/under 48" ribbon spar, a more rearward CG and lowered elevator rates, and improved pushrod and covering techniques.

The result is an excellent all-around combat wing for speed and agility, with good recovery characteristics. And they're tough as heck and just keep coming back for more.

Cody Remington's Espada on Spinal Tap Ridge.
Photo by Gregory Luck

Nick Stong flies his Spyder in Sunday's DS groove as Gregory Luck photographs. Photo by Mike Furcolow

Andrew "the Canuck" Williams pulls his Banana through the DS groove on Day Two. Photo by Mike Furcolow

Cat-1 Hurricane, composite plank from EdgeRC, the Duster a new 60” racer from EatonAir, and a Guppy 48” span aerobat from Leading Edge Gliders.

Also sponsoring the event were: SoaringUSA ($100 gift certificate), Canuck Engineering (60” V2 DS Lumberjack), Tuff Planes (P-39 Aerocobra), DreamFlight (Weasel Pro), Windrider Aviation (EZ Glider Pro Kit, Bee Kit and Micro Bee Kit), Hitec RCD (4x HS81MG, 4x HS65MG, Shirts and Hats), Ultra Hobbies (Wing Warrior Zipper), Predator Wings (kit to ‘predatorize’ the Windrider Bee), and Lavawing (3 Lavawing calendars), Montrose Model Aircraft Association (six tubes of Marine Goop and five rolls of bidirectional strapping tape) and the Montrose Comfort Inn (provided discounted rooms, coffee and tables).

Those who held the winning tickets gathered their prizes and endured the good-natured ribbing from the less fortunate. The rain and the conversation lasted well into the night as the crowd slowly filtered away to home, the Inn, or Michael’s floor.

Day Two.
Migration to DS Combat:

The pavement was dry in the morning, but the road up Flat Top promised to cake up into a slick brick under any vehicle that tried to go up. The weather was grey and moist and looked like it would stay that way. Luckily Mike Furcolow had a suggestion for another slope. The caravan headed 20 miles north to Delta, then 13 miles east. A short gravelly road off the highway brought us to the top of Big Mesa. There were enough convolutions to the slope edge to face any wind direction. What little wind there was drifted in from the southwest. Combat began with slow, float-y flying and feeble swipes. But one of the slope scouts hiked out and found a sharp ridge which faced the wind, but which also opened up the opportunity to Dynamic Soar (DS) behind the ridge and pull extra speed and energy from the light conditions.

Soon another pilot came to join the DS fun. Then the others saw what was going on, and drove over. Pretty soon the air was full of wings, diving into the backside of the ridge and pulling out faster, lining up in formation and swiping at each other, laughing and yelling and... hiking down to gather the “kills”.

Many pilots were DS-ing for the first time, or getting their first opportunity to really experience a nice groove. And no one there had ever experienced anything like 25 planes in a DS groove, all doing their best to smash into each other and make it back out “alive”! The ridge – christened Spinal Tap Ridge – and the

Event organizers say:

There’s no doubt it takes lots of work to pull something like this together. Thanks to everyone who came and for all the good times. That’s what makes it all worth it. You all bring something to the event that’s more than just the flying. (And the flying is good!) We thank you, and can’t wait for next year! Yes, we’ve already started planning, and believe us, you’re going to love it!

After the close of the combat on Sunday, Nick Stong flew his Spyder as the skies broke into mixed sunshine and storm. A final storm chased everyone from the hill and put an end to a remarkable weekend. Photo by Gregory Luck

WCSC Results:

Karl Decker	24
Jeff Lynn	16
Cody Wilson	14
Ian Frechette	13
Cody Remington	13
Donnie Colbert	9
Greg Luck	7
David Wathen	6
Andrew Williams	6
Hal Remington	6
Dale O'Donnel	6
Rick Weldon	5
Dawson Henderson	4
JC	3
Tom Owens	3
Nick Strong	2
Graham Gedeon	2
Mike Feuilly	1
Rich Bailey	1
Jim Ferguson	1

DS groove, turned what would have been a slow, boaty day of combat into a "continuous IV drip of adrenaline", as Ian said. He may have been talking about the DS flying, but there was also a certain thrill to running out into the swarm of wings to get to a downed plane.

The hypnotic, whirling battle continued until someone finally forced everyone to break for lunch. Tonia, Lisa and Jim fed the crowd. By way of lunchtime entertainment, Cody Remington, our home state junior F3J champion, gave us a good show of aerobatics and dynamic soaring with his beautiful yellow three-meter Espada. Andrew Williams kept wrapping his Banana in the groove, making it scream. And Nick Stong and Ian Frechette amazed all watchers with an aerobatic performance of formation DS with a Spyder (Nick) a 3m Fazer (Ian).

With full bellies, a fresh stock of adrenaline, and the rallying cry of "Combat On!" the wings dove back into the groove and battled it out for the rest of the afternoon. At 4:00, the event (but not the flying) ended. Scores were tallied, and awards given. The points winners are listed below. But The Winners, of course, are anyone who looks back on the event and get a certain sort of slightly crazy grin. ■

Bees in the DS groove on Spinal Tap Ridge, Day Two. Photo by Paul Arbogast

JR Aerotow 2007

Scale Soaring in the Heartland

Marc Gellart, ovssboss@earthlink.net
Photos by Marc Gellart, Tom Kallevang, and Steve Meyer

Middle America, central Illinois, is a long way from many folks in the United States, but when an event is significant enough, the faithful will come, kind of like the movie* Field of Dreams*. The JR Aerotow, held in Monticello, Illinois, is that significant event for the scale soaring crowd.

Held June 20-24 at the Piatt County Municipal Airport, the JR Aerotow brings together scale fliers from California to Florida to New York to Texas. The organization for such a comprehensive event is handled by the staff of Horizon Hobby and JR Radio, primarily Peter Goldsmith, Jodi Knopke, John Diniz, Carolyn Goldsmith, and Mike Seiniarecki who acted as the Contest Director. The dedication of the Horizon staff brings together resources that most clubs or individuals do not have and the access to such a top-notch airport to hold such a large event. One aspect that Horizon Hobby does to expedite the event is to provide transportation from their west coast warehouse facility to Illinois so that more fliers can attend the event. Without such effort by Horizon the event would not be nearly as large or diverse.

Fifty plus fliers flew ships that ranged from 2-meter spans up to half scale ships such as Dan Troxell's ASW-28 (opposite) that practically took up as much room in the Illini Glider Club's hanger as some of the full-scale ships that were there. There are times when you could look up and see as many as ten plus ships in the air and maybe two or three tow ships either towing or on their way back down for another hook up and launch. Many Team JR members and other fliers brought tow ships that did yeoman efforts towing one sailplane after another all day long as long as the weather held.

The weather is an issue that all events that last a few days must contend with during their run. Wednesday through Saturday morning was great, but, when the weather did become an issue, it was impressive. Being raised in Texas and living in the Midwest, the author has seen his share of large convective weather systems and even what he saw was impressive. The first bit of weather that hit was on Thursday night and damaged a few pop-up tents. The real weather that affected the event was Saturday afternoon when a long series of thunderstorms set in and dropped about three inches of rain in about four hours. There was also a very impressive lightning show to go along with the rain - those not from the Midwest got a great primer on Thunderstorm 101. It did finally clear off Saturday evening and flying resumed with scale and other type of aircraft taking to the air. Sunday also saw some rain develop in the afternoon as well and that brought the event to an end.

Most sailplanes that were flown at the Aerotow were fully molded or fiberglass fuse/sheet over foam wing models that come from European shops and manufacturers. On the other hand, there were kit or scratch built models that added to the flavor of the event. Many Air Flare KA-6 kits were flying, and a scratch built Schwitzer 1-26 flown by David Payne looked like the real thing in the air, even the air speed was dead perfect.

Arriving on Friday when the air was near perfect, some fliers were flying for nearly as long as they pleased if their frequency was available. Skip Miller was in the air for nearly four hours just having a great time with his six plus meter Nimbus that he imports. One side event that is held during the JR Aerotow is a cross-country event that can be flown on set aside channels. Not many fliers take the challenge, but Skip, whose Nimbus probably has more airtime than any other scale airframe in the U. S., will go out on the course at the drop of a hat. On Thursday, he covered in excess of forty miles and had to use two drivers to get it done. There is no other flier, save Joe Wurts maybe, that has more of a passion for flying cross-country than Skip.

The flight line was always active, safe, and organized; tows were leaving on the near side of the runway, landings were being made on the far side. The way the airport is laid out, operations were actually on what is the parking ramp, and the runway was not utilized. I know that one ship landed out and was found by a very nice full-scale flier who did not even take gas money for his effort. There were a couple of kills on launch, mostly these were the smallest ships there, and

between a cross wind and not being far off the grass, it took its toll.

The two most impressive ships there were really at two very far extremes of what you usually see at an Aerotow. The first was the Horten Parabel built by Chris Lash of Savage, Maryland. The Parabel is a design by the famous Horten brothers from Germany during the thirties and forties. It was constructed of blue foam, plywood, and fiberglass, and weighed about 50 pounds. It is actually set up as two halves and could be broken down. I would think that it would be nearly impossible to transport without this feature. Someone made a mention that the weight seemed extreme for a straightforward ship, but it was my understanding that it took a good amount of ballast to get it balanced. I am sure that when this project started, it was not anyone's idea that this ship would have ever ended up at this weight.

When I got to Monticello on Friday, the Parabel was on a towrope and ready for a launch. That launch was exciting and got unstable fast. The pilot punched off and made a beeline for the active and kind of came to a grinding halt after shedding the landing gear. Later in the afternoon they were ready again to fly. This got even more exciting. The initial tow went better and the tow pilot, David Payne, actually got a solid climb established with his Citabria. Within about 20 seconds, a slight dutch-roll started and the Parabel progressed from a very slight arc to finally becoming a 180-degree side-to-side oscillation. At this point David tried to just go vertical and shut down the oscillation and haul the Parabel straight up, but it did not work. The Parabel finally had the Citabria bogged down and finally it was beginning to loose to gravity. Decision time was at hand and the Parabel finally cut loose and got to flying and heading back to the active. Now, when this was occurring, nothing else was happening, literally. Everyone not flying was watching this action. The Parabel now was on the downwind portion of the pattern and rolling along at a high rate of speed. Lined up on final, all looked good. Bleeding off speed was not happening very fast but it was lined up and heading for what looked like a nice touch down. At flair, the airspeed was still a bit high and the Parabel was again flying about two feet off the deck and not slowing down a bit and the margin of available runway was running out quick. With the most resounding thud, the Horten contacted the first row of a corn field at I am guessing about 20 mph, and left a perfect indentation into about the third row of corn. It did not even leave a mark on the ship.

The second one-of-a-kind ship found at the Aerotow was a molded Fox that was powered by a small turbine engine, a Jetcat P-70, mounted at approximately the center of gravity of the aircraft. The Fox was built and flown by Eric Meyers from South Carolina. Eric is a member of Team JR and had come over just for Friday so as to demo the ship and then go back to Winimac, Indiana, for a turbine fly in. Just as with all modern turbines, start up is sequenced internally and out to the active he went. You will notice in the pictures that the exhaust is bifurcated to aid in having the hot gases get around the vertical stab, and there was an additional layer of aluminum applied to the leading edge of the vertical stab as well for further protection. The Fox flew effortlessly; basically he flew a full pattern flight. The sound was nice, not loud, and the flight was just one that you will not see at many events.

The JR Aerotow is a one-of-a-kind event; laid back, informational, and unique. JR Radio and Horizon Hobby have taken the lead again by holding another first string soaring event in addition to the World Soaring Masters. These two powerhouses consider RC soaring to be an important part of the aeromodeling hobby scene and this again is another example of their support of RC Soaring.

Enjoy the photos on the next few pages!


Learn Your ABC's
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JR
JR
Model Plane Hobby
SP-P587
D-2800
800

A view of the completely filled hangar. A couple of full size Schweizers in the background, then from the left front, a couple of Foxes, a Minimoa, Dan Troxell's ornage and cream Ka-6, the Super Cub towplane up front, and Dan Troxell's 1/2 scale ASW-28 on the right about half way back. Also in the picture, another towplane and more than a dozen more sailplanes. Photo by Tom Kallevang


ILLINI GLIDER CLUB
SINCE 1948

Opposite page: The Illini Glider Club hangar was usually filled with gliders, full size and model, during the event.

Left: Preparing and waiting for a tow.

Above: Glass slippers and wood and fabric gliders wait for their chance to get into the air.

John Diniz’ 5-meter span Ventus 2b makes a sweeping turn.



Upper left and right: Several pilots had gliders in the air at the same time. Left: Peter Goldsmith. Above: Relaxed flying.


ASH-25


EMS

Peter Goldsmith's ASW-25 comes in for a smooth landing with spoilers deployed. A close-up of front end with canopies removed is on the opposite page upper left. As can be seen in the other photos, interior detailing really makes a model come alive on the ground, and the addition of realistic figures to the cockpit, it's hard to tell a model from the real thing when in the air.

Above: Dan Troxell pushes his 1/2 scale ASW-28 onto the field. This ’ship weighs more than 40 pounds and has an eight meter span.

Right: Pilots, gliders and towplane. What a combination!

Opposite page: This photo gives an idea as to the size and weight of some of the sailplanes brought to the event.


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The jet-powered Fox by Eric Meyer, South Carolina. Uses a Jetcat P-70 engine and, of course, JR "feel the difference!" radio gear. The Fox spans four meters and weighs about 20 pounds. Chris really put the Fox through its paces, doing rolls and flying inverted.

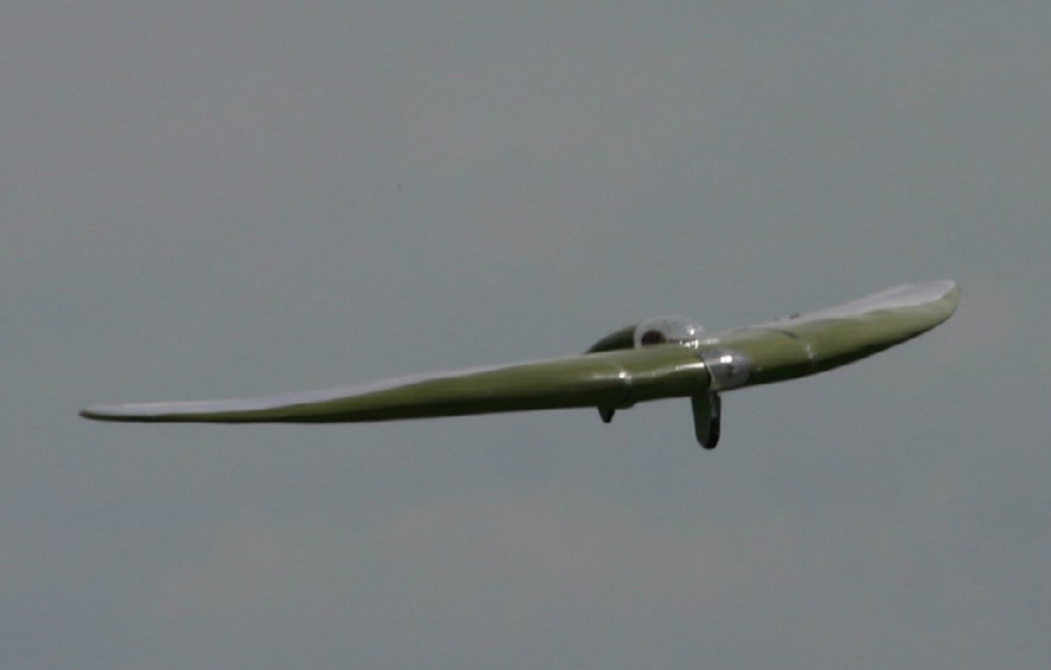
Tom Kallevang used his digital camera to record two excerpts of the flight. These are available from the *RC Soaring Digest* web site at <http://www.rcsoaringdigest.com/mov02685.mpg> and <http://www.rcsoaringdigest.com/mov02696.mpg>.

Two large-scale Ka-6s come in for a landing at the same time. This photo was captured by Steve Meyer.

Peter Goldsmith's ASW-25 comes in for a smooth landing. Cockpit details make this incredibly realistic in the air.

Eric Meyers and Dennis Brandt both brought a Windex to the JR Aerotow. This one has a folding prop

Mike Fox brought this great looking 4-meter Genesis to the aerotow. Mike's father was involved in the design of the full size 'ship, making a scale "proof of concept" model for Group Genesis.



Chris Lash's Horten Parabel. Chris, from Savage Maryland, built this 'ship from foam, glass, and plywood. The Parabel is a real a heavyweight at about 50 pounds ready to fly. Futaba radio gear. As can be seen by the above photo, it did fly this year.

The GT-80 powered TowMaule, flown by John Diniz, comes in after a tow.


The Piper Pawnee tow plane, powered by a GT-80. Definitely the coolest tow plane in attendance.

Left: Two pilots and their aircraft await a tow.

Above: Bernie Coleman and his Duo Discus.

Opposite: Dan Troxell and his 1/2 scale Ka-6. Uses a Rosenthal fuselage with custom constructed wings of obechi over foam. Truly a piece of art.


D-2008
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D-2009

Jerilderie 2007

Text and photos by Chris Adams, cjadams@bigpond.net.au

Flying gliders for three days in the middle of winter in the middle of outback Australia is quite possibly the most extreme expression of our fabulous sport/hobby.

But if it's challenging conditions, camaraderie, good food, good beer and the promise of high-level competition then Jerilderie has great appeal.

Jerilderie 2007 saw 62 competitors from all around Australia attend the 30th anniversary of this great event. The event is the biggest on the Australian calendar and attracts the best fliers in Australia.

Support for the event from the local community, the sponsors and even the families of those competing is terrific. The prize pool was supplemented by a very generous gesture from Dave Pratley of Airstrike Winches fame (<http://www.airstrike.com.au>www.airstrike.com.au) in the guise of a MiboModeli Shadow presented to junior flier; Michael Abraham.

The 3-day event uses Friday as a pre-event day for all fliers and offers the F3B pilots an opportunity to compete in the "Need for Speed" speed run. Steve Keep ran the show and from some promising runs Mike Rae stole first place with a rather tasty Kermit-green Furio-V.

Saturday saw fliers punching through the calm Jerilderie air from 8:30am and in these early morning conditions launching is everything in order to hit the 10 minutes of Australian Open Thermal rules. Mid-morning sees the times rise and from then on the lift becomes fairly consistent. Regular scores were posted on the back of the food van.

Credit to the Jerilderie Lions Club members who ran the food van and kept us knee-deep in cups of tea and bacon and egg sandwiches for the entire event.

Over the three days the cream rose to the top and David Hobby (current world champion F3J) claimed the top spot.

For more details regarding results and a gallery of photos, go to <http://www.lsfaustralia.org.au>.

A highlight from the event was undoubtedly the stunning weather; 30 minutes after the event finished the heavens opened and drenched the field.

Chris Staats hurls Mike Rae's Furio skywards.


FURIO

A bunch of weary but happy glider pilots.

Other highlights;

• Carl Strautins treating his 3-metre Icon like a HLG to hook a passing thermal and max out on Friday afternoon.

• Daryl Blow wrestling his Faser down to a soft landing after losing an outer wing panel to a midair.

• The massive launches despite the calm conditions; the team of Gregg Voak/ Theo Arvanitakis/Graham Norman/ Daniel Haskell seemed to push the limits more than most.

• The amazing array of current-tech models in attendance; Pike Perfects, Superiors, Muller Espadas, Carachos, Fazers, Furios and one Supra.

• The smooth running of the event; credit to CD Marcus Stent for juggling flying and directing the event. Credit must also go to Gerry Carter who developed the software that made recording, processing and printing of results easy work for Sarah Nye and Chris Adams.

For those interested in Jerilderie 2008, book accommodation early, bring warm clothes, and expect to compete in gliding's equivalent to the Dakar Rally.

Clockwise from upper left: Carl Strautins launches Matt Lowe's Pike Perfect. Daryl Blow launching for Mike Taylor. Tim Lennon launching Marcus Stent's Pike Superior. Theo Arvanitakis puts his back into it for Graham Norman.

Clockwise from upper left: Brian Ford holds aloft Klaus Mittendorf's immaculate scratch-built Europhia. Mike O'Reilly clinched the landing prize flying a Carracho 3000; Matt Wood calling. Tim Lennon launching Bruce Nye's scratch built Glitz. Klaus Mittendorf with his Europhia; beautifully built and highly competitive.

Upper: Brad Wilman is one to watch with his new Pike Perfect. Lower left: Brad Wilman (left) confides in Steve Boag post-flight. Lower right: Mike Taylor campaigned his new Shadow.

Clockwise from upper left: Klaus Mittendorf (left) and Brian Ford scanning for lift. Gerry Carter times while Alan Mayhew pushes his Supra ever closer to the sun. Hutton Oddy launches for Klaus Mezger. Gregg Voak getting a customary high tension launch from Theo Arvanitakis.

Clockwise from upper left: Brad Wilman nails his spot; the Perfect in its element. Mike Rae landing his Furio V; winner of the “Need for Speed” and 2nd overall in Thermal, Mike was on fire! Dave Hobby dominated for the entire event to clinch top spot. Marcus Stent (left) ran a tight, fair and enjoyable contest. ■

F6D Jerilderie

by Marcus Stent, with photographs by Chris Adams and Greg Potter

For the first time at the three day LSF Jerilderie Open Thermal event, we decided to run our Hand Launch Glider competition to the new F6D rules (with some slightly modifications to fit into the Jerilderie format). The competition was run just after lunch on each of the three main competition days and involved two preliminary rounds and a knockout final on the Monday. Our numbers were down a little from previous years, but this was due to the Open Thermal event also being the F3J team selection trials for the next World Championships and a number of pilots wanted to concentrate on the main event.

I arrived late on the Friday afternoon and decided to warm up my arm for the coming event. On about the fourth launch my Salome went half way up to launch height and then ploughed vertically into the ground in the blink of an eye. Ouch! What happened! I looked around to find my transmitter battery pack resting 10 metres away on the ground! It turns out that I had failed to clip the battery cover properly into the transmitter case after my last charge, and with the forces involved in the discus launch, had let go and jettisoned the battery. Without a backup plane I was very disappointed to not be flying in this intriguing new HLG event. It did however give me a chance to CD the event.

Saturday, Day 1

To keep the time away from the main Open Thermal event to a minimum and to keep the launches to a minimum, the format was to fly five rounds of Task 2, a 3-minute precision task and a landing back in the "launch area." I had marked out the course using four witches hats and after a short briefing we were away. Armed with a stop watch and an airhorn, the count went something like this, 3 … 2 … 1 … Airhorn ... 1 … 2 … 3 … 4 … Airhorn. Everyone had to be in the air between the two blasts of the airhorn and all of the timers started their clocks at the end of the second sound, not when the model leaves the hand. Simple really. The clock's stopped when the plane either lands or is caught.

Round 1

The conditions were very ordinary for a HLG because the temperatures were cool with a firm breeze and no real signs of lift. Launching high was going to be the order of the day.

Matt Wood launched the highest with his Asprin, closely followed by Theo Avanitakis flying a NAN models machine. Tim Lennon flying his OD Blade had an ordinary launch but found a small bubble of lift, but after following it down wind and then making it back to the field, had the model bounce off his hand and fall outside of the launch area which resulted in a zero score. This was the first casualty of the "Landing Area" rule and there was a collective "ooooh" from the competitors and the crowd which had started to gather and watch the event. Matt Wood's 58 seconds was now the winning flight.

Round 2

Again no real signs of lift as the competitors all hug above the launch area and Matt's superior launch height got him home again with 56 seconds to Hutton Oddy's 51 (flying an OD Super G) and Tim's 45, the best three times for the round.

Round 3

And there was Lift! A bubble had come through and there was a mad scramble to get in the good air. It was very very weak and only the smoothest of flying was going to keep you in it. Matt and Hutton worked it the best and managed to scrape out a 2:57 and a 2:35 respectively. Well done.

Round 4

Matt was on fire. A great launch and a few gentle circles gave him a 1:28.

Round 5

This belonged to Theo. He felt a feeder go through just before the start horn and his corresponding loud grunt and a 180 degree turn off the top had him in a nice little thermal. His return flight included

The four corners of the Launch Area/Landing Area was marked with witches' hats.
This kept the competitors in a relatively compact zone, and observers were always close to the action.

some loops and rolls, just to remind us that he had made his time. His landing at 3:00 was met with a loud round of applause from the crowd.

To make the scoring a little easier with the scoring program we decided to normalize the scores for each round. Scores after Day 1 were:

1	Matt Wood	4423
2	Hutton Oddy	4053
3	Theo Avaniakis	3731
4	Mike O'Reilly	2726
5	Tim Lennon	2380

Sunday, Day 2

My good friend Tim Lennon had graciously handed over our jointly designed and built Blade after Day 1 for me to fly. "Take this" he said, "You can't do any worse than me and I know you are dying to give it a go!" I was indeed keen and so we swapped roles and Tim took over as the CD.

Round 6 and 7

These were dominated by Matt Wood.

Round 8

Matt Wood again not only out-launched the competition but out-flew them as well. As everyone landed with less than one minute flight time, Matt was seen happily thermaling away to a great height. It was at this time that Theo and I looked across at each other and gave a resigned "shrug" of the shoulders. It was a lonely feeling standing there with models in hand, while one happy pilot thermaled away. There is no hiding in this event.

It was also at this time that fate took a hand and granted the mere mortals of the world an even break. As Matt came in to land he slowed the model down to count down the last few seconds to three minutes and landed smoothly... outside the launch area! A zero! Matt could not believe it!!! Because we had only set up the witches hats and not put down a marked line he had misjudged the edge of the launch area by mistake. A trap for the unwary. This was unfortunate for Matt, but the rest of the competition saw the funny side of it (given he was so far in front) and started "whooping and hollering!" It was a very funny sight. Matt just smiled and shook his head in disbelief.

Landing outside the Landing Area resulted in a zero score for the round.

Round 9

Matt wood extracted his revenge with a dominant flight.

Round 10

I finally put a good score on the board by finding a little bubble a loooong way out over the pits, which gave me the best time by about 30 seconds.

The results after Day 2 and Prelim rounds were:

1 Matt Wood	8206
2 Theo Arvanitakis	7310
3 Hutton Oddy	5286
4 Matt Lowe	3479
5 Marcus Stent	2999
6 Mike O'Reilly	2726
7 Tim Lennon	2380

Monday, Day 3
The Final

The format for the final was a knockout system of rounds, where the last place finisher for each round was eliminated until there was only one winner. The weather was again cool with a light breeze.

Final: Round 1

Matt Wood, Theo, Marcus and Hutton were the four finalists, and with the now familiar double blast of the airhorn to signal the launch window, we were away.

I am not sure why, but Theo, who had been launching well all weekend, had a shocker for this first knockout round and found himself on the ground in just over 40 seconds. At this point in time the airhorn sounded again and everyone has to land within the next 30 seconds and inside the Launching Area. Hutton had unfortunately caught a thermal and was now racing to get down within this 30 second landing window. And in his haste landed just outside the Launching Area and found himself with a zero score and eliminated from the Final. The new rules were taking a little bit of time to get to grips with. More practice required for everyone.

3 ...
2 ...
1 ...
Airhorn ...
1 ...
2 ...
3 ...
4 ...
Airhorn

Final: Round 2

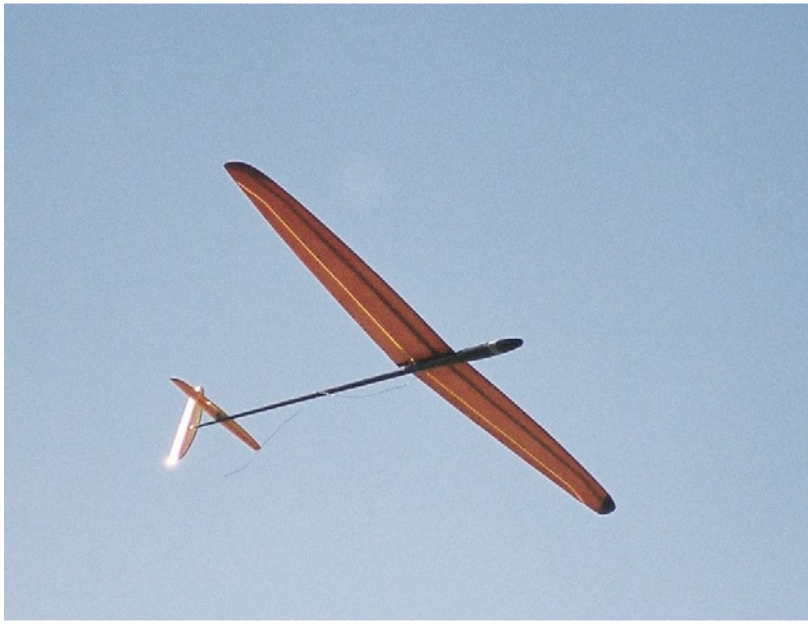
Matt and I gave each other the "death stare" and tried to psych each other out "Give up now Matt" I muttered, "Lets see who launches highest Marcus" responded Matt. "Oh @#$!," I thought, not responding.

And it was Matt who proved to be right! I gave my Blade everything I had during the launch, but I only managed to flutter the ailerons during the launch. Matt had a good height advantage over me, so he shadowed me like a hawk for the entire flight (and landed in the very centre of the Launch Area!) to record a very comfortable win, and showed his delight by performing a double arm salute and a cheer! Well done Matt.

The final results were:

1 Matt Wood
2 Marcus Stent
3 Hutton Oddy
4 Theo Arvanitakis
5 Matt Lowe
6 Mike O'Reilly
7 Tim Lennon

Right: Theo's NAN model flies nearly overhead.
Matt Wood launches his Aspirin.
Theo Arvanitakis and Hutton Oddy smiling between rounds.







Above: Greg Potter captures one of Theo Arvanitakis' launches.

Left: Standing, from left; Tim Lennon (with airhorn), Theo Arvanitakis, Marcus Stent. Kneeling, from left; Hutton Oddy, Matt Wood.

Right: Matt Wood's Aspirin.

The feeling after the event was extremely positive. The flyers liked the simple format, the minimal launching and the close proximity to each other. This allowed for a very strong tactical game and eliminated the luck factor from previous years where the competitors are spread over a 400m area.

It was also an excellent spectacle for the onlookers who gathered into a small crowd to watch the event and cheer on their team mates and friends. Being able to clearly see who was doing well and who wasn't, at close distances too, made the event very enjoyable for both the spectators and pilots.

There is now discussions taking place about holding a dedicated F6D National event each year and also about a selection trial for the next World Air Games, so there are positive things happening for F6D in Australia.

Some things to improve for next time include, marking out the Launching Area with some line marker to help the pilots keep their bearings, generating a simple scoring program to cope with the knockout phase of the event, and of course ordering some good weather never goes astray.

Overall everyone had a great time, the rules are excellent and I highly recommend everyone giving it a go at their local club some time soon. ■

A Year Up a Tree

Erik's Banshee, undisturbed since the last snowfall

An Unintentional Scientific Examination of the Effects of Weather on Foam, Packing Tape, and Electronics

An unbribed hats off (well, blown off) to Berg and Hitec

One more plane up three trees

And

A deeply inspirational story of how one man's hope and determination salvaged a bad situation... "And may it be an example for us all, in these hardest of times," he said, sipping his latte.

Almost up, before down after Dave's delta.

Found

Erik's voice comes over the handheld: "I've found it." And then, "It's unsalvageable."

I radio back, "Chris would salvage it." The Chris to whom I am referring is the infamous instigator of Chris Erikson's Wild Arsed Mountain Slopers, CEWAMS. We're down in the south of Warshington, on Grayback Mountain. Mt. Adams is fifteen miles West, Hood SSW, Mt. St. Helens hiding just over the horizon. Local volcanoes.

But three of us, Erik Utter, Michael Daily, and I, well, we're down an oak infested talus field, below some cliffs that Chris thinks are a good place to fly.

And the rest of them are flying. It's about noon, Sunday. We look up above the cliffs, where Chris's six-foot, EPP Delta, "Sheetrock," Dave Carey's 48" delta, Sanders Chai's 60" Tom Mays crunchy, and Michael Gore's streak of a 60" carbon Bird play with a falcon. The winds are probably only 35, but by the time I get back up they'll be 48, by the local weather station. And higher at the lip.

Radio Free Erik says, "The wing is all busted up, the fuse is broke, the tail feathers are off. It really isn't salvageable." Ha. Little does he know himself, or what he has in store for his own immediate future.

On the scramble down here, I asked, "Why don't we fly at places where we can get our planes back?" Well, it looks like we did, after a year.

Erik says, "I'm not going to disturb it till you get here with your camera."

I clamber a few hundred yards down the talus, to the base of the tree we've visited a few times before, once with a pathetic collection of ropes. Improbably, the plane went almost straight down. Mike says, "I bet it got ripped out of the tree by the snow-pack."

Dave's scratch-built Delta, core cut by Chris, snapped spar.

Erik charging shreds.

Erik's tree, Erik's plane:

The tree: 140 feet of Ponderosa Pine. Six-feet thick at its base. 120 feet up, it had held Erik's 60", vee-tail, EPP Banshee. A year before, also on Memorial Day weekend, Erik completed it, applying the last of the tape on Chris's ironing board. Uh, yes, Chris never goes anywhere without his ironing board. But it's not to keep his hankies flat. And it's not just a good table. Other paramilitary organizations have flags. CEWAMS is a non-organization, so it can't have a flag. We only have an ironing board. Our motto is, La Lengua Tamevoula, which Mike says means, "Repairs in the field." I never believe him. Tammy is a brand of hootch. But I digress. First time ever.

The Banshee: Up top, Erik explains to another of our party, Sanders Chai, "It flew great, till the wind died, and it found the tallest tree on a slope with only a few of the things. We look four hundred yards down below the cliffs, to Erik's tree.

Sanders asks, "How long did you get to fly it?"

Erik says, "About ten minutes."

Another glider which goeth from tree to tree to tree, three

But that isn't the only plane in a tree. Saturday afternoon, as Erik and I drive south, Michael Daily calls. The rest of them have been flying Bald Butte, Oregon, about half way between Mt. Hood and Hood River. Mike D. says, "We'll meet you at Grayback. But we're a bit held up."

Then Mike D. says, "Michael Gore *Uttered* his Big Mach into the top of a tree."

Swiss cheese or wing?

Erik (Utter) objects, “Don’t take my name in vain. You shouldn’t call it an “Utter” unless you can’t get it down.”

I say, “If it’s not that far up, it’s a low Utter. If it’s really stuck, it’s an Uber Utter.”

The Big Mach is a 2.75 meter, F3F glider.

A while later, Michael Daily calls back, “Michael Gore climbed the tree and threw it out. Chris manned the transmitter. But something must have shifted, because Chris couldn’t control it, and now it’s in the top of another tree.”

Two hours later, Chris, Sanders, and the dos Michaels arrive.

After their assortment of 4x4s lumber down the rocks that could rip the tranny out of a Subaru, Michael Gore says, “I started to climb the second tree, but I was too tired. It’s still up there.”

Sanders’ mom has sent down fantastically marinated Korean steaks, and five side dishes. We top it off with a couple pounds of strawberries and whip cream on angel-food cake.

Okay, I know someone out there has a weak heart. So I’ll skip the suspense. Michael Gore left early Monday morning for Seattle, and stopped at Bald on his way. Sunday’s winds had ripped the Byrd out of tree two, and deposited it in tree three. Michael Gore climbed it and got it all back. “All,” in this case, means all the pieces. But definitely repairable.

Down the talus again, and again

Setting the Wayback Machine back to when Michael Daily, Erik, and I have gotten three-fourths of the way back up from playing Mountain Glider Rescue, which means a sweaty, long climb and traverse across the talus to where there is a break in the cliffs. Dave Carey’s voice

Michael Gore retrieving (almost) his 2.75 meter Big Mach. Tree one of three.

comes up over the handhelds, “Uh, how far back are you guys? Uh, my plane is about a hundred feet above Erik’s tree.”

When I get back nearly down to Erik’s tree, Dave radios, “I see you. You’re way to low.” I climb back up barely stable basalt chunks. Dave’s wing is soaking up the shade under a lone, small maple.

I radio, “I have to apologize for hogging all the exercise.” I should have mentioned the sideways summersault and the slip on the butt and the unintentional splits around a tree and the bruise in front of the elbow.

The carbon spar of Dave’s home-built delta is snapped. Sanders says, “It sounded like a shot.” On the way up, I take pictures of the epiphenomenal gliders playing with a falcon above the cliffs. Dave meets me at the top. But I have to go down again. Whomever invented those little belt clips that are supposed to keep a radio attached to you developed a system that works 100 percent of the time while standing on a showroom floor.

Flying the big winds

Finally I get to fly.

My 60" carbon wing, vee-tail pops skyward, scrambles, bucks, dives, and rolls—fantastic gyrations--before settling gently at the last second, just in front of me.

Sanders says, “That was the most amazing five-second flight ever.”

Chris says, “Do you want me to toss it?”

“Michael Daily says, “How much do you value that plane?” I turn down the aileron rate. It flies pretty well, streaking around, and doesn’t get busted, like a few other times.

Determination in the face of entropy

And then it gets crazy: We all walk back to the trucks. The wind is just too much. That’s not what’s crazy. That’s just wind. What is crazy is Erik, the hood of his Cherokee up, the pile of shredded foam and glass tape sitting next to a charger. I say, “What?” Erik says, “I’m charging the battery.”

Erik always charges batteries fast. He says, “They’re cheap. Why not?”

Erik also has his radio out, and is wiggling the sticks.

The battery takes a charge. NiMH. Soaks up 1000 mAh and peaks.

Six PM. Down to the camp. Erik sets up on the CEWAMS flag. Well, on Chris’s ironing board, and starts taping the fuse back together. What?

A while later Erik tells us, “Two of the three servos worked. HS-85 metal gears. The third, the bolts were totally rusted. I got it apart. The motor was rusted together. So I grabbed it with a pair of pliers, and broke it free. Now it works fine.”

Then Erik says, “We need to do a range check.”

Four hundred feet through the oaks and on the other side of a rise, the Berg receiver that spent the last winter under snow works flawlessly. Mysteries abound.

Gorilla glue and water, mixed, foam up and fill holes.
Chris, Sanders, Forest, ironing board.

Lack-of-conflict-of-interest disclaimer: Neither the author nor his subsidiaries have received kickbacks or free goods or offers of such from any of the companies mentioned, in exchange for writing favorably of their products, so far. Bother. (Hint.)

Erik and Chris are mixing Gorilla Glue with water, to make foam patches for the gaping holes in the wing. A year of exposure has warped severe camber into the stabilators, so Erik cuts a new vee-tail from a salvaged, coroplast, Mike McGavick campaign sign. I lap-splice strips from the remains, for ailerons. Erik says, “It’s a challenge.”

I feed cheese puffs to Chris’s owner, Forest, a golden retriever. Forest is an Uncle, to Chris and Karen’s one-year-old, Jacob Ryan.

Mike Gore and Sanders go off to play with the evening winds, which have died down, but not much.

Darkness. CEWAMS party time.

Tent. I check for ticks. Last year one got me. Immature ticks grow on field-mice and chipmunks that feed on acorns. Oaks cooperatively try to starve the rodents’ population down for a few years, and then produce a crop too big to get eaten. The remaining rodents multiply like rabbits, allowing a bumper crop of ticks. Estimates are that a percent or more of ticks in Southern Washington and Oregon carry Lyme disease.

Morning. The air is roughly dead. Erik is taping most of the wash-in out of the wings, and covering with clear packing tape.

Repeat: After a year of narsty exposure, all the original electronics still work. The only parts not salvaged off the slope are the tape, glue, the Mike McGavick sign, and a couple threaded rods and clevises.

Monday, will it?

We drive south-east to Diamond Mtn. Mt. St. Helens is just peeking up to the West, and we’re closer yet to Adams and Hood. Chris points out seven “shield volcanoes,” rather short things, a result of very liquid lava flows.

There’s fine thermal lift, but only between sheering winds. Why didn’t we just drive south and catch the winds up the Gorge?

Forest and Chris taking a well deserved rest during Erik’s exhausting work.


Erik, Chris, Forest, the Banshee about to be test flown, and Mt. Adams.

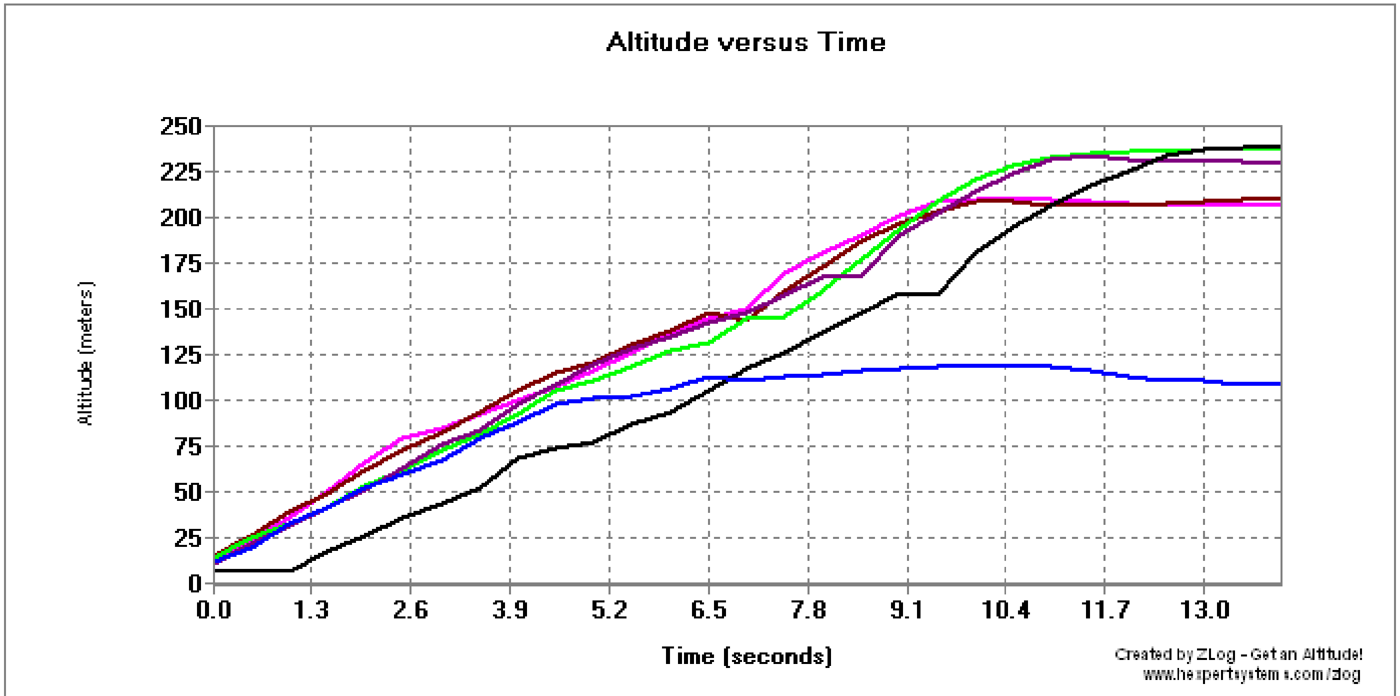
The Banshee flies again!

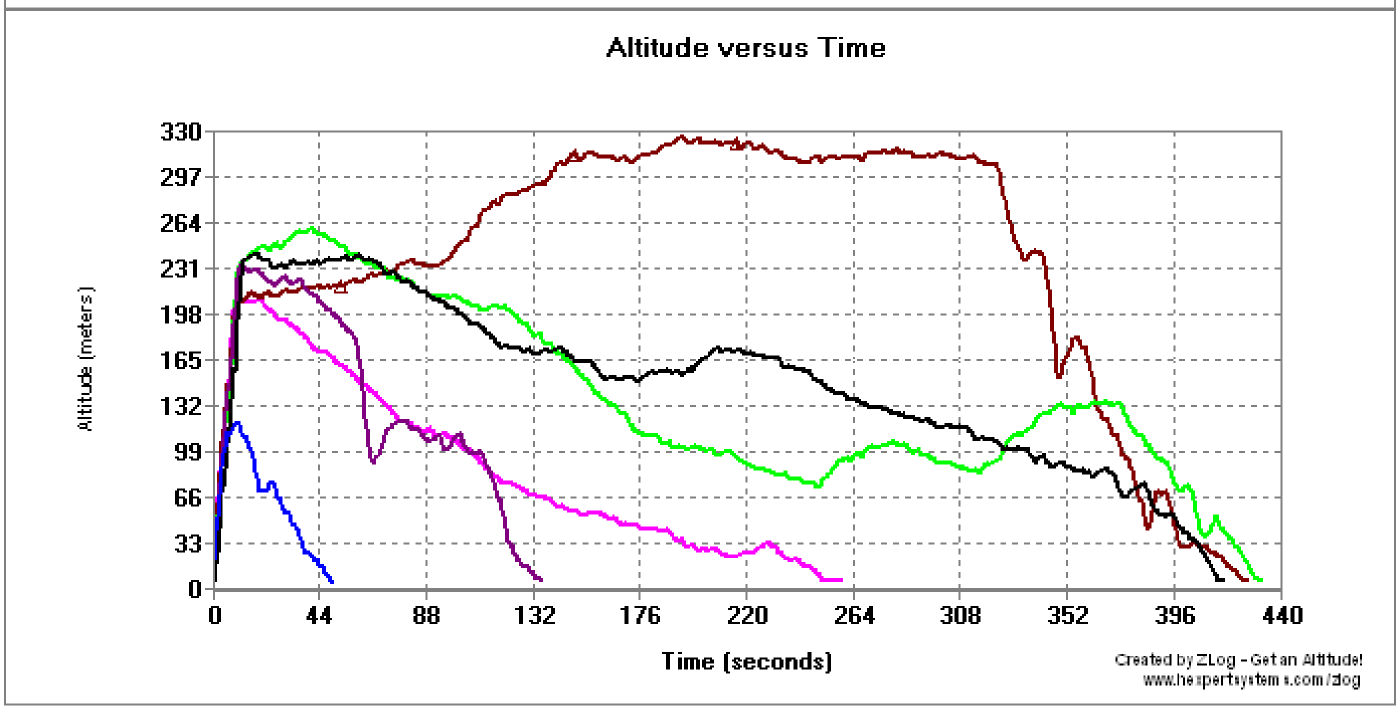
We had to go there anyway, to drive west to I-5 and up to Seattle. But we poke around. I fly my old polyhedral, under-arm launch Ionosphere and Michael Daily's Red Herring between sink cycles. This becomes the only time I have ever seen my buddy Forest bother a plane. He steps on the boom of the Ionosphere. CA fixes the tail (of the plane. Forest's tail is fine.).

Erik is busy at the ironing board.

Five o'clock in the afternoon. The Banshee looks like Frankenstein (in the slope report from our next trip, you'll see Plankenstein), or Lazarus in grave-cloth windings, or some unearthed mummy. There isn't enough lift to keep it up, even if it were in perfect order. But three or four test flights and it's trimmed. It drifts down the hill, over the trucks, across the parking lot, and yes, into a tree.

However, this time it's a low Utter. ■





ZLog traces

taken during the Montreal Area Thermal Soarers (MATS) Interclub Round 4 contest, June 30 2007.

Courtesy Corey Groves <corey.groves@gmail.com>

The upper graph depicts launch data, the lower depicts entire flights. ■

Rules for RES/100 Challenge

Courtesy Evan Shaw, evanevshaw@gmail.com

The RES/100 Challenge is a postal style event where all pilots country-wide can fly at their own clubs on the specified weekends. A two weekend windows is allowed, but only one attempt may be made.

Dates for the events in 2007are:
Round 1: February 17th or 18th OR February 24th or 25th.
Round 2: June 22nd or 23rd or 24th. (To coincide with the Nationals.) If you do not attend the Nats you may fly at your own club on any one of these dates.
Round 3: October 20th or 21st OR October 27th or 28th.
All scores are sent to a central address and the collective results publish.

The rule are:
1. Only RES/100* models may compete.
2. Six flight with two throwaways. (Best 4 out of 6)
3. Working time 12 minutes
4. Flight time 8 minutes. (Normal system applies)
5. Spot landing as per the table below, measured from the spot to the nose of the model.
6. The club can run a MOM type event if they like or a pilot can elect to fly whenever he likes, but once he launches (as the model leaves his hand or the hand of his helper) he will have 12 minutes to record an 8 minute flight. He can re-launch as many times as he likes within the 12 minutes but only the last flight and landing will count. Two stop watches must be run. One for Working time and one for Flying time. In a MOM event the CD monitors the Working time and clearly indicates to all competitors the start and finish.
7. The 8 minutes flight time starts the moment the models releases from the tow line.
8. Flight time stops the moment the model comes to rest or the 12 minute working time ends.
9. No landing points for over-flying working time.
10. No landing points if the model touches the pilots or his helper.
11. Launching may be by standard 200 meter winch, 150m hand tow or 150m un-stretched bungee.

This is also a team event, so clubs must nominate a maximum of three pilots per team before the event starts. There is no restriction on the number of teams a club may field. All team mates must fly at the same venue and on the same day.
The team score is made up of the sum of the best 8 flight recorded by the team.
Single pilots may also enter.
As mentioned above a MOM competition can be organized within the club on the day as an option to make the event a little more interesting for the competitors. This is dependant on the club having enough winches available. As many pilots must fly together as possible. However, as this is a postal event the score submitted must be the actual ones recorded and not normalized scores.

All results must be submitted by not later than the Wednesday following the event to Evan Shaw at evanevshaw@gmail.com or faxed to 086 511 0835.
Please supply the following information:
The Pilots name and Team name,
The Models name, section and span
The date
The pilots score (Only the total of his best 4 flights please)
The team score (Only the total of the best 8 flights form the team please)
A brief report and a few photos if possible for inclusion in the South Easter.

(*RES/100 models are:
1.Models with any span but no more than rudder, elevator and spoilers for control.
2.Models with span no more than 100” (2540mm) and may use any control combination --- every control known to man if the designer so desires!
For example, a model of 3 meters span can only have Rudder, Elevator and Spoilers.
If the model is equipped with Ailerons, Flaps or whatever control system the span may not exceed 100 inches or 2540mm.)

Landing Bonus	Points	50	45	40	35	30	25	20	15	10	5
Fullhouse ships	Meters from spot	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
2met plus with spoilers		0-2	2-4	4-6	6-8	8-10					
2met with spoilers		0-3	3-6	6-9							
2met no spoilers		0-4	4-8								

Score Sheets	Date		Venue	

1	Pilot's name				Team Name		
Flight	Time flown (min : secs)	Total seconds	Type of model A,B,C or D	Distance from Spot	Points	Total	
1	:						
2	:						
3	:						
4	:						
5	:						Total (Best 4)
6	:						

2	Pilot's name				Team Name		
Flight	Time flown (min : secs)	Total seconds	Type of model A,B,C or D	Distance from Spot	Points	Total	
1	:						
2	:						
3	:						
4	:						
5	:						Total (Best 4)
6	:						

3	Pilot's name				Team Name		
Flight	Time flown (min : secs)	Total seconds	Type of model A,B,C or D	Distance from Spot (cm)	Points	Total	
1	:						
2	:						
3	:						
4	:						
5	:						Total (Best 4)
6	:						

Team Name		Team Score (Best 8 flights)	

Email completed score sheets to evanevshaw@gmail.com or Fax to 086 511 0835

Michael Knight launches his Supra off winch-driven monofilament line while preparing for the Junior F3J trials coming in the Fall.

Photo by Alyssa Wulick

Konica Minolta 7D, ISO 100, f8, 1/640 sec., 20 mm