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THE JOURNAL FOR R/C SOARING ENTHUSIASTS

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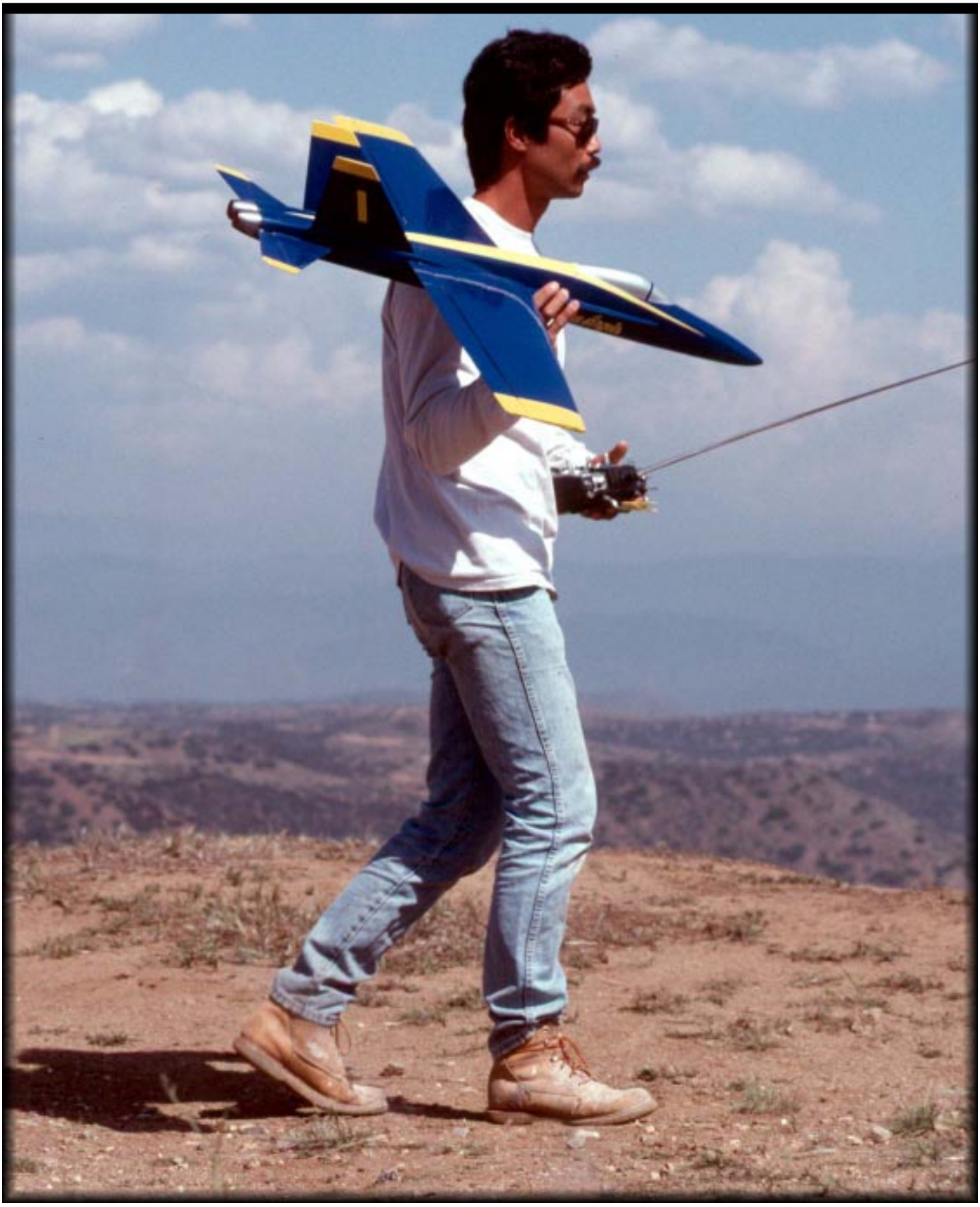

R/C Radio controlled SOARING DIGEST

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ABOUT *RCSD*

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

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TABLE OF CONTENTS

Don't forget to check out the *RCSD* web pages each month. Cover photographs are always available for viewing, and usually available for downloading, as well. Special article .pdf files are frequently available for a limited time, and of course our web masters update the highlights and status information of each issue as it becomes available.

Advertiser Index

RCSD ON THE WEB

http://www.b2streamlines.com/RCSD.html

Monthly Feature Photography & Web Version of the Printed Article (where appropriate)
Highlights & Mailing Status of the Current Issue
About RCSD
..... **Subscription Information**
..... **Advertising Rate Card** (Adobe Acrobat PDF format)
..... **RCSD Feature Columnists, Reporters, and Editors**
..... (E-mail/web addresses, plus general information about their areas of interest)
"Getting Started in RC Soaring" ..... Getting started guide - Adobe Acrobat PDF format
Links to Organizations, Special Interest Groups & Clubs
On-Line Articles - Great articles originally written for the printed version of *RCSD*.
..... "Trimming Your Sailplane for Optimum Performance" by Brian Agnew
..... "Flys Faster" by Dr. Michael Selig
..... "The Square-Cube Law and Scaling for RC Sailplanes" by Dr. Michael Selig
..... "Modifying & Building the MB Raven (Parts 1-4)" by Bill & Bunny Kuhlman
..... "Butterfly and Moth Airbrushing Tutorial" by Joedy Drulia
Bookshelf Listings - A listing of recently published books of interest to aeromodelers.
Complete RCSD Index, 1984-2002

The Soaring Site

Sailplane Builders 2003 Eastern Workshop

We received an invitation from Tom Blevins to the R/C community to join Sailplane builders and pilots for a Mid-summers Night Weekend of fun. The registration form for this event is also included in this issue of RCSD (back page).

Friday, June 20th - Sunday, June 22nd
Ridgely Airpark
Ridgely MD on Maryland's Eastern Shore

"This year's workshop emphasis will be on flying, sharing sailplane-building experiences and techniques, and just hanging out together. We will have a few technical presenters and as many kit-providers and builders as we can muster, but there will be more time for flying and talking with friends. Come with plans and bits and pieces of what you're working on, or a flyable finished product: just let us know what you're bringing.

"For more information on the Sailplane Builders see:
www.sailplanehomebuilders.com/

Contact:
Tom Blevins
tomblevins@gwi.net
(207) 882-6396
178 Boothbay Rd.
Edgecomb ME 04556

Workshop Program in-the-Works

"Steve Arndt, Eastern VP, will show and talk about the Carbon Dragon he built, then demonstrate the Dragon's outstanding performance. [Take-Offs are optional, Landings mandatory!]

"Leo Benetti, with Alisport (www.alisport.com), will talk about his 12 meter Silent motorglider and the new Silent II 13 meter. The Silent series, with and without motors, are available in quick build kits providing outstanding performance at a moderate price. Leo will also bring photos from his recent trip to the factory in Cremella, Italy.

"John Marske, hopefully, will fly his single-wing Monarch for us and update on his latest design work.

"R/C Sailplanes - We are hoping to find someone (or several!) to talk about R/C Sailplanes and demonstrate them with flights at the Airpark.

"Jeff Snyder and his resident Glider Cub will have their collection of gliders to see and discuss. Schweizers predominate but we might be surprised.

"Mark Maughmer PhD, Penn State Aerodynamicist, is expected to give us a variation of his talk "Aerodynamics for Dummies" and bring his guitar.

"Goetz "Pipa" Bramesfeld, PSU, will talk to us about German glider developments and hopefully show us the wing testing (destruction) video again.

"Dave Hudnut and Al McCarty will talk to us about metal aircraft building techniques and report on their building progress.

"Tom Blevins will talk about Advanced Composites construction, give a sample demonstration, and welcome questions during the Workshop.

"Bring what you know. Bring what you have to show. Everyone has something to offer."

Thanks for the invitation, Tom!

Happy Flying!
Judy Slates

Slope Flying

Jeff Fukushima at PSS Festival, Cajon Summit, California in 1999.

Jeff walks to the edge to launch his F-18 Hornet, which he kits and sells along with other slope jets and PSS warbirds at Vortech Models.

Photography by
Dave Garwood, New York.

SCHEDULE OF SPECIAL EVENTS

May 15-18, 2003
Midwest Slope Challenge Wilson Lake, KS
www.alltel.net/~mwsc

May 24-25, 2003
So. California PSS Festival Cajon Summit, CA
Brian Laird, Slope_Scale@compuserve.com
<ourworld.compuserve.com/homepages/slope_scale>

June 6-8, 2003
Spring Aero Tow Festival Visalia, CA
Chris Pratt, cmesoar@quik.com
http://www.cvrcsoaring.com
(559) 733-5188 (7-9pm)

June 13-15, 2003
JR Aerotow Monticello, IL
pdf file available on the RCSD main web page

June 20-22, 2003
Eastern Workshop Ridgely, MD
Tom Blevins, tomblevins@gwi.net
207-882-6396

July 19-26, 2003
AMA/LSF NATS Muncie, IN

October 10-11, 2003
Texas National Tournament (TNT) Dallas, TX
www.SLNT.org

November 29-30, 2003
Tangerine Soaring Championships Orlando, FL
www.orlandobuzzards.org

Please send in your scheduled 2003 events as they become available!

on the Wing B²

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Blackbird XC.3

As mentioned in a previous column, we're hard at work on our third Blackbird XC. This will be the eighth Blackbird to come off our building board. As usual, we've incorporated many modifications to the original design besides the enlarged size. This column will describe all of the various changes to be incorporated in this rendition and share some of the highlights of the construction process. The second installment will cover completion of construction and test flying.

Our experience with Dave Jones' Blackbird planform goes back nearly twenty years. We've always found it to be relatively easy to build, stable and maneuverable in flight, and, in spite of its total lack of exotic materials, capable of full power "pedal to the metal" winch launches which end in thrilling zooms to great altitudes.

The Blackbird XC has a span of 107 inches and an area of 2300 square inches. The last one we built weighs 162 ounces for a wing loading of just over ten oz/ft^2 and is an incredible flying machine. Due to its size, it cruises sedately through the sky between thermals. Once in rising air, the low aspect ratio of the planform and the light wing loading make climbing fairly easy. All of the sheeting on this aircraft, with the exception of the fin, is 3/32 inch balsa. The Blackbird XC now under construction will be sheeted with 1/16 inch balsa throughout, not only reducing the overall weight of the sheeting, but also decreasing the amount of lead placed in the nose. As an example of this weight saving, each wing for the last version weighs 48 ounces, the new wings will likely weigh between 32 and 36 ounces. The projected flying weight should therefore be well under 162 ounces, and we anticipate a wing loading of under 9 oz/ft^2.

We're using Hitec HS-605BB servos throughout — one for each elevon, one for each flap, and a fifth for the rudder. These servos are close to the size of a standard servo and come equipped with dual ball bearings and helical gears. This servo can put out 77 oz. in. of torque at 0.16 sec./60 degrees on 4.8 volts. These "high torque" servos were recommended by John Packer, the manager of Hobbytown in Parkland WA, and we're extremely pleased with them.

Vertical fin and rudder

After putting rudders on our two meter Blackbirds and finding a noticeable improvement in handling, we decided to add a moveable rudder during construction of this XC machine. This dictated a redesign of the fin so that the hinge line would not be swept back so severely. The leading edge of the wing is swept back ten degrees, and we swept back the leading edge of the fin 20 degrees. Since the hinge line is located at 50% of the local chord, it sweeps back at ten degrees. Additionally, the moveable rudder will be of open frame construction with diagonal ribs rather than fully sheeted. This should save some weight compared to the same surfaces fully sheeted. The included 3-view (Figure 1) shows the old fin planform and the redesigned fin and rudder assembly.

Because of the large chord and expected flight speeds, we wanted an airfoil of about 10% thickness. We also wanted an airfoil with a small deadband around neutral. The S 8020 seemed to meet our needs, despite some recent notes which state the deadband is slightly larger than originally measured.

Because of the modified fuselage shape, the already large sub fin was made deeper. We also wanted to make sure that upon landing the wing would be driven to below its zero lift angle of attack.

Airfoil

Our previous versions of the Blackbird have used the CJ-3309, the CJ-25209, and the BW 05 02 09 sections. These airfoils differ from each other in significant ways.

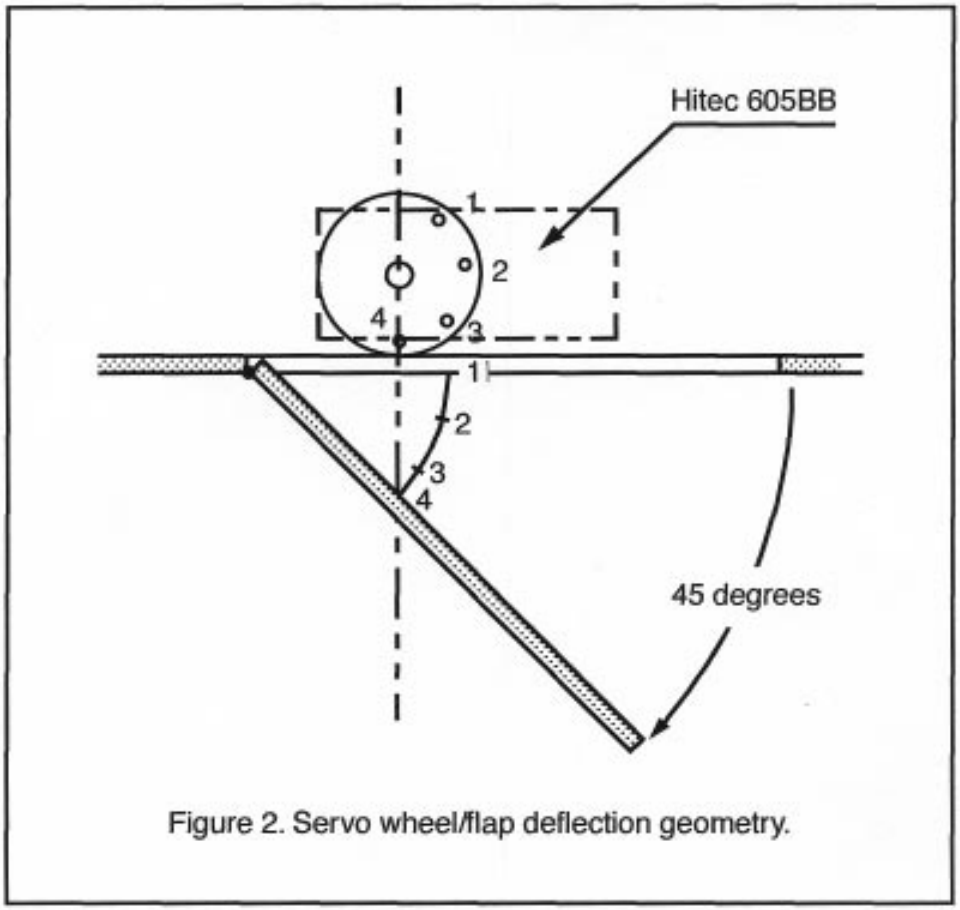
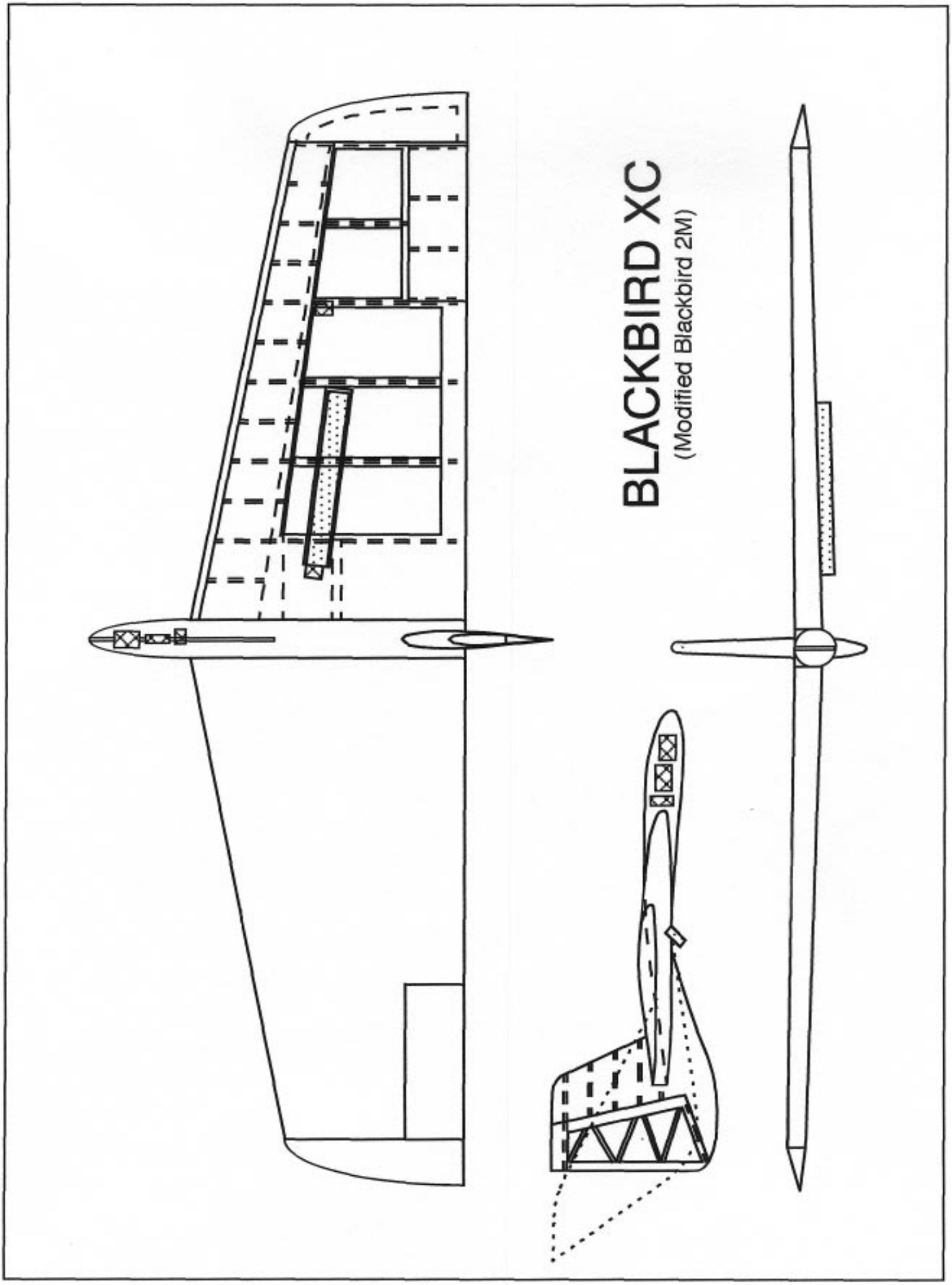


Figure 2. Servo wheel/flap deflection geometry.


BLACKBIRD XC
(Modified Blackbird 2M)

The CJ-3309 has a flat lower surface from the leading edge radius back to the point where the reflex starts at 75% chord. Building a warp free wing on a flat surface is therefore automatic.

The CJ-25^{2}09 has what's commonly called a "Phillips' entry." The lower surface curves upward from 25% chord forward to the leading edge radius. This reduces the camber from three percent to two and a half percent. Flight speeds appear to be slightly faster with this airfoil than when using the CJ-3309. Launch height is greater because of the lower drag, allowing higher zooms, and climbing ability in a thermal is not noticeably affected.

The third section, the BW 05 02 09, has no flat portions on either the upper or lower surface, making a construction jig of some sort a necessity. We really like this airfoil because of its low drag and reduced reflex. The CG location is in exactly the same spot as the version with the CJ-25^{2}09 section, but the natural oscillations in pitch which appear when flying straight ahead for long periods are slower and of lesser magnitude. The performance improvement over the CJ-25^{2}09 is remarkable. Energy retention during zooms off the winch are consistently higher, cruising between thermals is noticeably faster, and the aircraft is more quiet.

Despite the more convoluted construction methodology, we chose the BW 05 02 09 for this aircraft.

Flaps

The topic of flaps on planks was a subject of our correspondence with Dave Jones, designer of the Blackbird 2M. While such flaps cannot be used to improve thermal climb, they can be during winch launches to improve initial climbout and for glide path control during landing. The generalized "rules" for flaps on plank planforms are as follows: location of the leading edge of the flap at 40% of the local chord; approximately 5% of the wing area; deflection of 45 degrees should be sufficient.

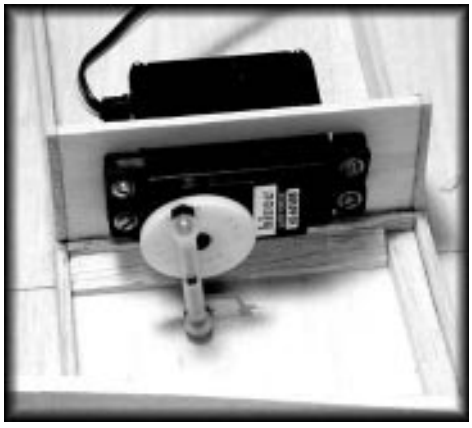
The flaps are 18 inches long and three inches wide. They consist of 1/16 inch balsa exterior and interior sheeting, and 1/8 square spruce diagonal ribs. The control horns are mounted on plywood triangles which fit into the corner under the servo output wheel. The flaps are lightweight and torsionally rigid. We used standard nylon pinned hinges, five per flap. Our Dremel was mounted on a router base and just enough balsa was removed for the hinge to be flush with the flap and wing sheeting exterior surfaces. We then cut 1/64 inch plywood into the shape of an aerodynamic strut and used that to cover the exposed surface of the hinge.

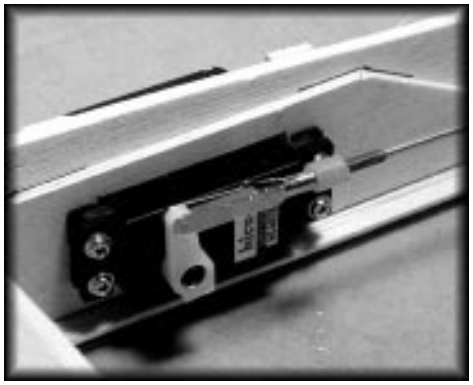
We're using Hitec HS-605BB servos throughout — one for each elevon, one for each flap, and one for the rudder. These servos are close to standard size, have dual ball bearings and helical gears, and can put out 77 oz. in. of torque at 0.16 sec./60 degrees on 4.8 volts. The flap control system utilizes a short pushrod with ball links at each end. The servo wheel is set so that throttle trim (low speed) adjusts the closing position, and when the flap is fully deflected there is no pressure against the gear train. See Figure 2 and the flap servo photo.

We settled on a Y-harness for the flap servos. This allows us to use the throttle channel for controlling flap deflection, the aileron and elevator channels for the elevons, and the rudder channel for the rudder. The flap servos were mounted in mirrored positions in the wings, so one servo had to be modified for reversed direction of rotation. Our original plan was to use a Hitec seven channel receiver and mixing options on the transmitter, a JR PCM 10. This channel utilization allows us to use our FMA M5 with additional protective foam surrounding it, and our JR Century 7 transmitter should the need arise.

Fuselage

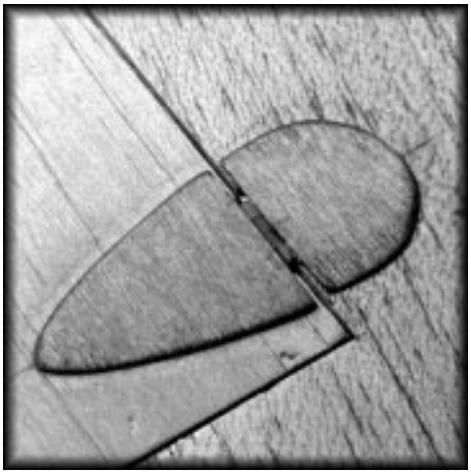
The Blackbird 2M per plan fuselage





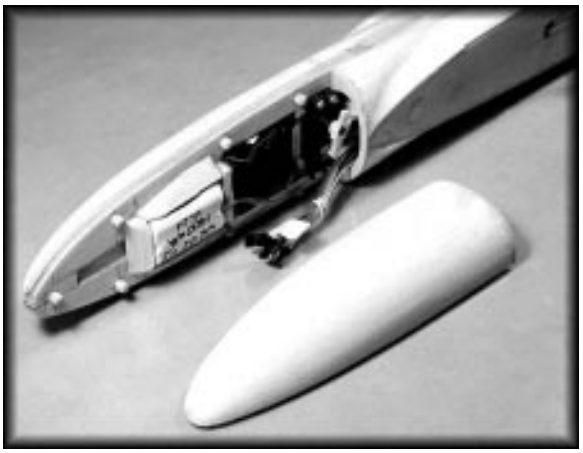
The elevon servo is mounted right behind the main spar. Notice the high strength clevis and pushrod. The Hitec HS-605BB servo puts out 77 oz. in. of torque, so the system has to be of more robust construction than the usual.

The complete flap and driving servo system. Each flap is 18 inches long and three inches wide. The leading edge sheeting is not yet in place. A rolled paper tube acts as a conduit for the elevon servo cable.

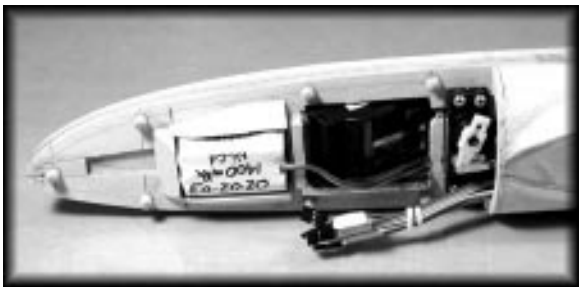


The flap hinges are inset into the 1/16 inch balsa sheeting, then covered with 1/64 inch plywood. The outside edges of the plywood were rounded with sandpaper before being glued in place.

(Left) The flap servo mounting and pushrod system. The hinged edge of the flap is toward the left.



View of the left front of the fuselage nose. 1400 mAh battery pack, Hitec seven channel receiver, and vertically mounted rudder servo. Still plenty of room in the forward nose for lead ballast to adjust CG location.



Another view of the forward fuselage showing the location of the various electronic items. The receiver location was framed for the Hitec seven channel, but the FMA M5 will be used with lots of room for protective foam.

The fuselage nose with side blocks in place. The area in the region of the wing spar is still open. Fiberglass and resin are still to be applied.

(Right) A visual comparison of the Blackbird XC.2 (front) and Blackbird XC.3 (rear). The new XC.3 has less internal volume, but is far superior from an aerodynamic perspective. Note that the steel wing rods are inserted into both fuselages. The wing placement is therefore parallel.

construction consists of 1/8 inch plywood sides which match the wing root profile from the high point to the trailing edge. From the high point forward, the fuselage side view is similar to the airfoil. The rectangular cross section at the high point gradually blends into a solid nose of roughly circular cross section as the plywood sides bend inward. The internal volume is incredible. A four cell 1600 mAh sub-C battery pack forward, receiver behind. Without a rudder servo installed, there's more than enough room in front of the spar for two Ace thermal sniffers.

We desired a fuselage with a cylindrical cross-section from the nose to the intersection of the wing at the expense of internal volume. Our original thought was to construct a central keel and a slip-on nosecone. We sketched out the side view in full size, then drew in circular cross-sections from the nose to the high point of the wing root. In looking at our creation, it became obvious that a slip on nosecone would not be possible because of the fuselage curves as seen in the side view. Our decision was to retain a central keel and form large balsa sides of balsa block.

Fuselage construction began with the keel. Two pieces of 1/16 inch plywood were glued together to form the 1/8 inch thick main portion. This part of the keel is mounted to the main spar wing rod at the rear and to a 5/8 inch dowel near the wing leading edge. The dowel is a lightweight method of establishing a good carrythrough between the keel and the wing roots and acts to prevent crushing if the wings happen to swing forward on a rough landing. Additional rims of 1/16 plywood were glued to both sides of the keel. More about those rims in a bit.

A few of our last construction projects have utilized large carved and hollowed blocks. We're getting to be pretty good at the shaping process and had a large balsa block of the correct dimensions to work on. Blocks were first run through a jig saw to give the rough profile, then tack glued to both sides of the completed keel. An X-Acto carving blade, a freshly sharpened low angle plane, a razor plane and carbide sanding bars were used to get the fuselage to match circular templates fabricated from credit cards.

After external shaping, the blocks were popped off the keel. Holes were drilled around the perimeter of the keel to serve as holders for several mounting/alignment pins. The nose blocks were then reattached with wide masking tape and the holes in the keel used to guide the drilling of matching holes into the nose blocks. The nose blocks were removed and hollowed using a Dremel and a carbide grinding tool. The holes for the pins were coated with thin CA and then cleared by hand using a matching drill bit.

The keel is quite sturdy by itself. It's very much stronger with the side blocks attached, and we're sure the strength will increase further with the additional layer of fiberglass which will encase the entire fuselage structure.

Other modifications and details

The spruce spars are tapered in width from 3/4 inch at the root to 3/8 inch at the tip. This is wider at the root and more narrow at the tip than scaling the spar caps

as indicated on the two meter plans, where the width should be constant for the entire length of the spar. The spar webbing is also heavier at the root and more light at the tip than would be indicated by the two meter plans. As mentioned before, the completed wing has no carbon or Kevlar, yet is strong enough to withstand full power contest winch launches with a barely noticeable flex at the root.

As is now our usual practice, the elevon servos are located in the wing behind the spar and directly in front of the inner edge of the elevon. This allows a direct linkage between the servo output arm and the servo control horn. Additionally, the Frise type elevon has been eliminated. This version will once again use simple fabric hinges at the upper surface.

The rudder servo is mounted vertically on the keel directly in front of the leading edge of the wing. The pushrod cable consists of 1/16 inch music wire through a yellow ridged NyRod which goes through a red NyRod. This pushrod goes below the 5/8 inch dowel which traverses the fuselage in the forward part of the wing.

In the past, we've run the antenna along the leading edge of one wing. In this version, the antenna is routed behind the rudder servo, down the right side of the fuselage and up the fin.

The rudder servo is connected directly to the receiver with a shortened cable while the flap and elevon servos require cable extensions within the fuselage. The elevon servos also require 24 inch cable extensions within the wing. All servo cables are cut to minimum length and twisted to inhibit spurious noise being introduced into the signal paths.

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Suggestions for future columns can always be sent to us at either P.O. Box 975, Olalla WA 98359-0975 or <bsquared@appleisp.net>.

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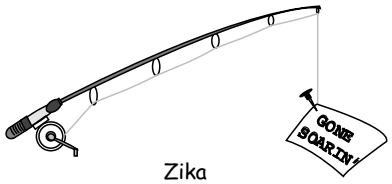

Zika

GORDY'S TRAVELS

Gordy Stahl
Louisville, Kentucky
GordySoar@aol.com

Balance Affects Landings!

In my recent past articles I talked about how to find the 'balanced' point of a full flying stabilizer thermal duration sailplane. I talked about how a 'balanced' model is free to indicate the smallest lift, turn tighter slower and safer, and land slower.

Most guys I meet react with the usual over reaction of: 'rearward' balanced models are uncontrollable. As if 'balanced' meant un-balanced.

I often ask them this question, "If you balanced your model according to my system, and it flew slower, indicated the smallest lift, turned tighter at slower speeds, needed less surface deflection and landed slower, then took it home, measured the balance point, found it to be 2" behind what the plan showed – would you move it up to the plan mark?"

I seldom get an answer. But there is a reason to move the balance point forward from what seems to be a really optimized balance point! And I figured it out today at the flying field.

I had brokered a purchase of a sail-plane for a relatively new full function sailplaner, and decided to set the plane up for him. I flew it as it came from a talented contest pilot, and found it to be a real dog. To be fair, the wind and humidity weren't the best for TD flying. But the model really was NOT my cup of tea... Sluggish on rudder, quick to stall, and tight thermal turns spiraled downward.

So, I flipped it upside down to check the balance, only to find that it was carrying a considerable amount of lead in the nose. How could that be, when the guy who had it has won a lot of tough contests? Simple. Many of us learn to fly the models we have, well.

I pulled all the lead out (about an ounce or so), then launched again. Inverted showed that it didn't need any down to keep it flying level, so I went looking for thermals. It flew great! No problems what so ever; it showed lift, rudder yawed it like it was on rails. It wasn't till I brought it down for a landing that I found that it was not 'balanced'.

It tracked in on line to the spot without a hitch, smooth in yaw, pitch and roll, until I poured in some landing flap; then she popped up and wallowed around. No way I was going to make it near the spot.

Turns out that the balance point was dead on, for the chord of the un-flapped wing.

Learning about balance can only be done through experimenting. Getting your model optimized will allow you to spend more time learning to read air. Have you found that point that is perfect for your un-flapped chord? Then added in some nose weight to get your model set for all conditions?

So many of us move from one new 'super' model to the next, only to find they all seem to fly as disappointing as the last. Maybe it's because they are 'hobbled' by the balance and trim set ups. If measuring a CG is what you've done in the past, why not give flying to diagnosis balance instead? Balance to fly, not to match some drawing.

Give it a try; you'll find that the plane you have may be the plane you have been paying for! I did! ■

30TH ANNUAL
TANGERINE
SOARING CHAMPIONSHIPS

ORLANDO, FLORIDA

NOVEMBER 29 - 30, 2003

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DAILY AWARDS TO 3RD PLACE IN EACH CLASS

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HAVE SAILPLANE, WILL TRAVEL!

Stealth Sloper over the dunes of Lake Michigan near Luddington.

By Tom H. Nagel
904 Neil Ave.
Columbus, OH 43215
tomnagel@iwaynet.net

This column is dedicated to soaring vacations. If you have a favorite sailplane saga, consider writing it down for *RCSD*. If you are planning a vacation that includes your plane and transmitter, consider making notes as you go, and working up an article later. Take photos. Collect maps. And send your story to Tom Nagel at tomnagel@iwaynet.net for gentle editing and suggestions.

Tom

The Stealth Sloper
A travel sailplane from "Have Sailplane, Will Travel!"

A few years ago my son and I were at the Weak Signals RC extravaganza in Toledo. Robart had just introduced a line of molded styrofoam toy hand-toss gliders, and I bought one for Andrew, an F-117. Robart was also selling toy gliders styled like a UFO, and an F-16. At the time the Robart representative had at least one of the models fitted with an 049 engine and servos. The little F-117 was nicely done, but proved to be a lousy toy airplane. It didn't glide all that well and mostly wanted to roll inverted and dork in. We hung it up in the garage and generally forgot about it.

Two things brought the F-117 back to mind recently. The first was the advent of Gulf War II, Act Two of the War of the Bushes. The second was that flying buddy Chuck Rumele had installed a little GWS receiver and some servos in a little toy styrofoam flying wing he'd found at an RC swap shop. With the F-117 back in the news and Chuck flaunting his inventive craftsmanship, I remembered the little Robart foamy and took another look at it. The time seemed right. The cheap GWS receivers and servos on the market certainly made the conversion of the little glider to a sloper a more attractive opportunity. I got out the Dremel.

For those of you who haven't seen the Robart toy F-117, it is small and light,

Toledo Show

Mark Gellart flying the Stealth Sloper in the XC event at the NATS.

Jim Carlton (not shown) on the Cleveland Lakefront Park.

Terry Edmonds landing the stealth sloper in the Scale competition at the NATS.

(Below) Cumberland, Maryland Slope Fly-In.

spanning only 18" and 19" in length. Still, that is 171 square inches of wing area. The glider comes equipped with a set of stick-on markings for the cockpit, inlets, and so forth. The V-tail is molded separately onto a block of foam that fits into a recess at the rear of the fuselage. There are four recesses molded into the bottom of the wing, one forward for modeling clay ballast, and three behind that for finger holes and throwing. The rear-most hole is more or less on the proper CG point.

My first move was to toss the glider to make sure I had the CG more or less close. It was, and the glider was still a crappy flyer. I marked the CG on the fuselage top and bottom, and then dug out the modeling clay ballast from the front hole.

Using sanding blocks I smoothed off the rough edges here and there, and started sanding a taper into the trailing edge of the glider's wings. Those TE's are molded fat and square. I tapered the bottom surface of the wing, left the top surface more or less flat, and thinned the last few inches of wing until it was down to about half its original thickness. I added a piece of EPP cut into a sharp wedge shape for the nose of the plane, covering and attaching it with black electrical tape.

Next, I built elevons to tape onto the trailing edge of the wing. The first set, out of 3/4" TE stock looked too small. I built a second set out of 1/8" balsa sheet. They are cut to match the TE of the wing and are roughly 6" long and 1" wide. I sanded a taper into their trailing edges and a 45 degree bevel into their leading edges. Control horns I cut from some leftover counter top samples, the little pieces left after building some RDS driver pockets. I glued these into the elevons and covered the elevons with black monokote.

The battery, receiver and servos came from a crashed Pico Stick electric park flyer. I had a couple of GWS 7-cell 110 mah nicad packs that Nimh Technology had orphaned. I cut them down to 4-cell receiver packs. Then I masking-taped the 4-cell pack, the servos, the receiver and the elevons right onto the model glider in the places that I thought likely, to check how that changed the center of gravity. It was pretty close. Time to warm up the Dremel.

The Dremel's grinding stone is a great way to cut servo pockets in styrofoam. It took almost no time to cut out two servo pockets, and a recess for the GWS receiver. I also enlarged the front ballast hole into a slot for the 4-cell battery. Using the router head and a ruler, I cut grooves for the servo and battery wires. The plane came out at about 5 ounces, or a wing loading of about 4.2 ounces per square foot.

Almost all of the on-board equipment was recycled stuff. Even the wire pushrods were recycled from the old crashed Pico stick. All of the gear, including the elevons, was put in or on with clear packing tape. The only new piece of equipment was the spiral wound indoor-RC antenna. These little

gizmos really work, cutting down stray signals for the little single conversion GWS receivers, and at the same time providing a neat, compact installation.

I recruited Andrew to help me hand toss the F-117. It turned out that the neutral elevon setting involved a bit more down trim than I would have expected, but once that worked out, the model glided much better with RC control than it ever had a free flighter. Time to hit the slope.

My test slope is a small hill behind a church near my office. I tried out the F-117 in brisk west winds. The plane was twitchy in roll and needed a lot of flying, definitely not a hands-off floater. But elevator response was good and the trim was right on. The major discovery in the first slope flight was that the plug-in V-Tail is fragile. I kept the plug in block but I rebuilt the rest of the tail out of black meat tray styrofoam, which gave me a chance to thin the profile of the tail for penetration purposes, to make it stronger, and to color it stealth black, like the elevons.

In mid-April I finally got a chance to try the stealth sloper on a real slope in real wind, 20 to 25 mph out of the southwest. A little less wind might have been better; the stealth had some difficulty punching out through the wind to get in front of the slope. Still, it flew pretty darn well for a recycled kid's toy. The stealth has a quick roll rate, and a little exponential helped a lot. Axial rolls were easy. Loops were difficult, ending in a vertical inverted stall and back flip. Slope landings were controllable, and crashes (of which I had a few) were survivable. The pointy EPP nose worked well.

An un-planned encounter with a guardrail ended the flying day, but the little F-117 went back together on the workbench with some fast epoxy.

The Stealth Sloper has a number of key advantages. It is small and cheap. It is easy to pack along on a trip. In a pinch it is disposable.

Another advantage is that you don't actually need to fly it. You can leave it in the car. For that matter, you can leave it home on the workbench. You can just stand on the slope with your transmitter in hand and grin into the wind. If folks ask what you are doing, just point out vaguely into the air and tell them you are flying your Stealth Sloper. I have included photos of various notables flying the Stealth Sloper at locales around the Midwest.

Robart Mfg. apparently still makes the F-117. It is available for under $10 from a number of toy outlets on the internet. Try kidstoysplus.com, for example.

Sources:

Robart Mfg. Inc.
PO Box 1247
625 N. 12th Street
St. Charles, Illinois 60174

www. Kidstoysplus.com
sells Robart toy gliders

www.happyhobby.com
another source for the glider

Grand Wing Servo, makers of small cheap onboard electronics, plus a whole line of airframes and electric motors.

Indoor RC antenna:
from Dave McCarthy at LiteflyRC.com, 614-539-9259
Azarr makes a similar unit, www.azarr.com
also available from DJ Aerotech, djaerotech.com

Slope Photos courtesy of the Central Intelligencia Agency (HSWT)

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Visit to Fran LeClercq's Shop

by Lee Murray
Appleton, Wisconsin

On March 15th, seven members of the Silent Flight Special Interest Group of the Valley Aero Modelers visited the LeClercq home for an interesting and delicious meeting. Sally prepared delicious salads, soups and finger food.

Like most other AMA clubs we are modifying our constitution and field rules. We discussed the proposed safety rules and etiquette guidelines for using the sod farm. However, most of the time we were talking about what was going on in the sport. We notice that it is more difficult to get new fliers to become part of the RC modeling scene. The models are either too expensive or take lots of time to construct.

We would like to have more public exposure and think we can do better by attracting spectators and even have the cable TV company cover our events. Perhaps take some member videos and air them on TV. We just had a model show and auction in which we demonstrated video telemetry with a model flown off frozen Lake Winnebago.

This would take some work but we just might find someone who can mix and edit a great program from Dave Beck's electric and solar powered XC flights and Rob Lehman's sky cam videos (electric glider and wet powered model).

Some things I learned during our visit. Fran is now 77. He has on display a model just like the one he made and flew in 6th grade on the playground. He has some old models hanging on the wall like a triplane that was controlled by a Proline radio; an early RC unit that was good in its time but was big. He had photos of him and his models as a young man. The ailerons on the top wing were powered by a large servo in the fuselage and a square tube to rotate a servo wheel in the upper wing. Fran is still living in the Bond Street home he built without a mortgage as money permitted. The extra spaces, like kitchen cabinets, are now filled with transmitters while the fridge has batteries and charging equipment as shown in the photos. The kitchen that does the actual

cooking in the house is in his housekeeper Sally's apartment that is just below the level where Fran lives most of the time. Sally has been Fran's housekeeper for as long as I have known him (20+ years).

Check out the photos of the models in the fine wood cases. The one shown has two unlimited sailplanes in it. One is a Spectrum and the other will go without a name since Fran couldn't recall what it was called. Hanging from the ceiling are two Graphites, a Probe, a Dodgson Lovesong, and several others.

Fran's abilities as a craftsman often are called into use as we ask him to repair parts of our high tech models we damage during the flying scene. During our summertime weekly flying sessions and contests, Fran operates the VMC retriever. On rare occasions he flies his models but he takes great enjoyment in seeing others including his sons, Dave and John, fly his beautiful models. It doesn't get any better than this for a club to have a member like Fran in your midst. ■

TECH TOPICS

A Fiberglass Fuselage Repair

Dave Register
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This is an often-discussed topic in the magazines, web sites, chat groups, etc. As more pre-molded aircraft prevail in the marketplace, it's a good idea to know how to repair them. We always envision our latest creation or acquisition lasting forever but experience says that if it lasts one season without a serious ding, you're doing pretty good.

This little article is not intended to be a primer on the subject. Much has already been written by a great many folks who know a lot more than I do. But I did have a recent occasion for some re-construction of my Omega 1.8 and think I learned something useful from the experience.

One lesson to be learned from this crash is to be sure you know which plane you're flying. Computer memory is great but when you do something stupid, it's pretty unforgiving.

In this case, after a long, medically enforced absence from flying, the day finally came to get back to the field. So naturally there was a little apprehension anyway.

When I got to my favorite schoolyard, 3 or 4 young people were roller blading in one of the parking lots and came over to ask all the usual questions: how much does it cost, what does that little thingy do, why are there so many buttons on the radio, etc., etc.

Well, between trying to satisfy the kids and trying to assemble the airplane, I forgot to call up the right aircraft. So the Omega went into the air with my Whisper 2M control setup. Not good!

I'm not sure which scattered faster, those kids or the pieces of the fuselage.

It turned out that the fuselage was broken in about 6 places but everything else was more or less intact. So maybe we can do something with this baby after all. A careful search in and around the crater was made to gather all the big stuff to see what could be done.

Once everything was cleaned up, it looked like the pieces could be put back together with very few gaps. The procedure went something like this.

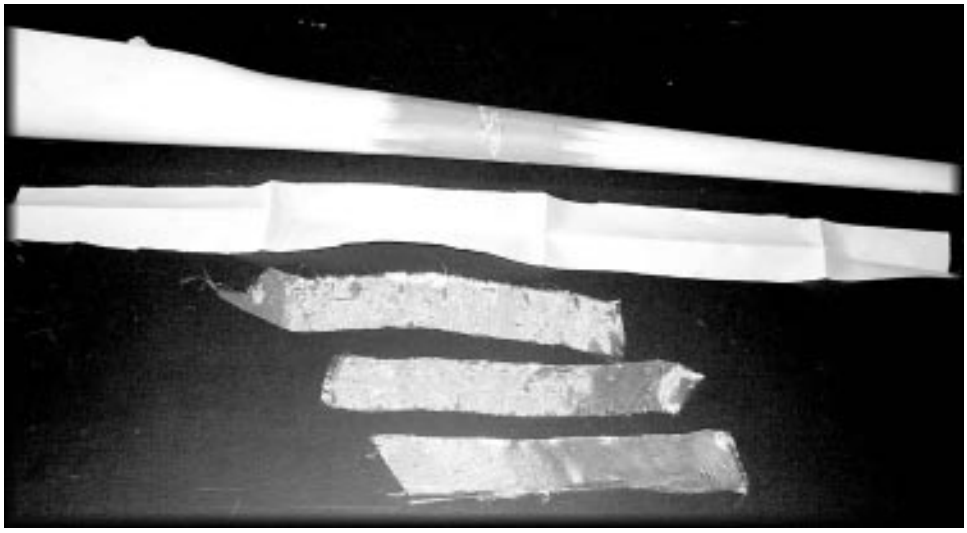
After the radio and motor were extracted and cleaned up, the fuselage pieces were put back together using CA and a light dusting of filler. I use thin CA and then use a small squeeze bottle to dust the glue lines with baking soda. This is a bit like re-assembling a jigsaw puzzle and it needs to be done with very careful attention to alignment.

Once the CA kicks off, you now have a piece of aircraft that you can pick up and handle. In the cockpit area, a few layers of 0.75 to 1.5 oz. cloth on the inside surface will restore mechanical integrity. I use West Systems for repairs like this, not 30 minute epoxy. If you don't slop too much resin in here, things will be nice and strong. You don't need a high quality finish in the interior but don't go too heavy on the resin either.

It's the outside that's really a problem. You want things to look right but often there are lines, ridges and little chunks missing. Fill the gaps with some of the leftover resin from gluing up the interior (before it sets!). At this point I mix in enough micro balloons to make it pasty so it wont drool after you've put it on.

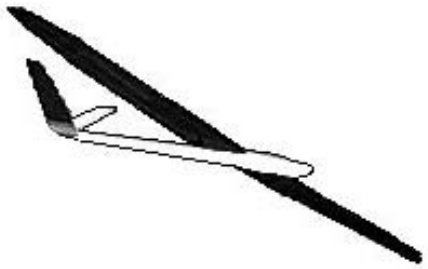
Following full cure of the biggest gaps, rough sand the exterior globs - the micro balloon filler sands very easily. But you still have the lines from the cracks and some other dents and nicks. Here's where a neat idea really helped me.

(continued on page 15)



Path to Improvement in Thermal Soaring

By Bill Kuhl
Bkuhl@luminet.net



Introduction

After my first year of sailplane flying, I thought I was a fairly competent RC sailplane pilot. The second year of flying, my flying improved significantly also, in fact every year I seem to improve some. This made me realize this is a hobby that will provide continuous challenges. The first couple years, I often blamed the conditions for difficulty in thermalling, as my skills improved I found success staying up in lift in more conditions. With sailplane flying, fishing, and many other things, luck should be a decreasing factor in your success as you improve.

The objective of this article is to discuss attitude and approach to improving thermal flying skills, not so much technical details covered in many other sources. It is about breaking down the elements and practicing smaller parts before trying to perfect everything at once. Hopefully I can offer a couple of tips that have helped me.

In writing this article, I came up with several points that were important to me.

Attitude

Your success or failure has more to do with controllable factors than by luck, good or bad. Seemingly small factors added together can give big results. The skills will not be learned overnight; if they could be it would not be such a challenging, interesting hobby.

Adjusting Your Attitude

It is only natural to think that the small things really don't matter, how could a slight difference in the curve of a wing make a difference? In an activity that is so much about efficiency, all the little things together can make a huge difference. One of the biggest attitudes to overcome is that your skills don't need improvement. Contest flying should prove to you that there is room for improvement.

The fair weather attitude is one I admittedly have problems with, practicing only on days with light wind and plenty of sunshine, will not make you a competent contest pilot. Besides, when you try to fly on the slope in 30 mph winds, it will be a traumatic experience when landing without some windy weather experience.

If you have power plane experience, following thermals will take some change in your flight paths over the field. As Dave Thornburg stated, "Thermals don't care about field boundaries, tree lines, and such." In Thornburg's video I thought he made it seem like thermals travel in a straight line downwind. Paul Naton in his "Secrets of Thermal Flying " video showed graphics of how the path of a thermal downwind can take many

(continued on page 16)

Prepare a few strips of fine weave glass for the exterior repair. 1/2 oz. to 3/4 oz. will do. Also cut up some peel ply that will be larger than the repaired area. If you're going around a compound curve, cut this into long strips that won't wrinkle too much around the curve.

Now mix up some microballoons in the West systems. Not so thick this time. Wet the area to be repaired (a solder brush works nicely), lay on the glass strips and then add the peel ply. When you put on the peel ply, tape one end of it to a good section of the fuselage and then pull it very tight across the resin/glass area. The strip needs to be long enough that you can then tape it down to a solid area of the fuselage on the other side of the damaged section.

Repeat with each strip of peel ply until the entire area is covered. If you've pulled hard enough, two things happen:

1) You force the resin into the glass cloth, and

2) The excess resin bleeds out through the peel ply.

At this point, your repair looks REALLY ugly. Have faith. Set it aside for 24 hours, then come back and pull off the peel ply. What's left behind is a very well wet out repair with no excess resin and maybe a few small ridges that can be wet sanded out with very little effort (this is where the micro balloons really help).

After wet sanding, hit it with primer to find any little pin holes and fill those. Prime and wet sand, then spray with the best color match you can find.

For the tail boom of a glass fuselage, it's even easier. At this point it's hard to get to inside the boom so we're working on the outside. Again, reassemble with CA and a sandable filler and be sure the alignment is REAL good.

Wet sand the fuselage to expose the glass all the way around. Then use the resin micro balloon mix to coat the repair surface. Lay down 2-3 layers of 3/4 oz. cloth and then spiral wrap the boom with peel ply. Tape one end and pull it pretty hard across the repair area. Tape the other and then leave it alone for 24 hours.

After the resin has cured, remove the peel ply. Most of the excess gunk goes with it. Sand and prime as before and you'll wind up with a very strong repair with little, if any, visible signs of irregularities after you're done.

A couple of pictures of the break in the Omega boom are shown as an example. One round of primer and wet sanding was all it took to get back to near original quality.

The Omega is back in the air again. Now if I could just fix that brain-glitch about which program to run with which planeÖÖ.

■

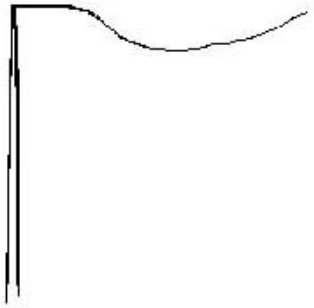
twists and turns in the path downwind. This appears closer to real world conditions in my opinion.

Practicing the Parts

Selecting, building, and trimming a sailplane has been covered in many articles; what is important, is to have a good flying sailplane. If the sailplane is fighting warps or the center of gravity is incorrect, the performance suffers greatly. A sailplane that thermals easily, will give you more practice flying in thermals.

The areas I practice revolve around finding the strongest lift and making the most of the lift by smooth flying. Through practice learn to recognize the ground signs, and fly in marginal lift conditions to practice smooth flying.

Practice Recognizing Ground Signs



Many articles have been written about using the shifts in wind and changes in temperature to locate thermals. These are often subtle signs, especially changes in temperature.

With repeated practice over time you become more sensitive to changes in temperature and wind speed and direction. Try to correlate wind dropping, and finding lift directly upwind. Notice when all of a sudden it gets much warmer right where you are standing.

What makes spotting lift tough, is that while you are trying to figure out where the lift and sink might be, you also have to fly the sailplane. You have to become so comfortable flying the sailplane that your brain can think about other things.

At first you might want to have devices to help with this, such as thermal flags. Besides a thermal flag, I purchased an accurate wind speed indicator and a heat-sensitive thermal indicator like the free flighters use. What I found was that the temperature changes were pretty small, normally only a few tenths of a degree. Wind speeds changes were more dramatic, often jumping up and down several miles per hour within a short time period. Eventually you get to the point where you feel it is getting warm or you feel the changes in wind speed, or direction on your body.

Recognizing Changes in Speed

Along with ground signs, develop your skills in detecting lift by watching your airplane. Recognize the changes in speed. With hours of practice the little changes in speed were more noticeable to me. Observing the sailplane suddenly pick up speed was a very clear indicator to me that it was in lift. Not as obvious was when the sailplane was slowing down, it was most likely in sink. Recognize when the plane is working hard to penetrate the wind, this is really killing performance. If the plane is inside the thermal it shouldn't have to work so hard trying to penetrate.

Practicing, Smooth Flying

With a limited amount of energy, not wasting it is very important. You might think your flying is smooth, but practicing flying in margin lift conditions may prove there is room for improvement. Recognize that any control inputs you are using are creating drag. Think about your flying in terms of energy. The plane is flying with only so much kinetic energy; unnecessary movements such as extra control movements, stalling, or sharp turns, will bleed off the kinetic energy very quickly. The smaller the plane, the worse this will be.

Tight thermal circles turns take a huge amount of energy; if the plane is not circling in lift, the potential energy of altitude is being lost. This means it is best to have a high degree of certainty that you are entering lift; if you hit weak lift, adjust quickly to find stronger lift, or straighten out to fly out of sink.

Learning to Fly Smooth – Ways to Practice

Fly in conditions of lighter lift; I often fly later afternoon, early evening. With practice I am climbing in lift later in the day consistently.

Practice flying with an underpowered electric slow-flight plane and try for maximum duration. I noticed that a slow-flight plane of mine would barely climb when other people were flying it (beginners and glow-powered pilots). Most of my flights were of considerably longer duration and of higher altitude because I was using less and smaller control inputs.

Practice flying smooth by flying from small slopes; to stay up on a small slope takes very smooth flying, recognizing when the lift is decreasing or increasing. When the plane is climbing in lift, that is the time to turn. When you are in the core of the thermal, this is when you can experiment with turning tighter to see if the plane goes up even faster. Keep working to have the plane climbing around the entire circle.

Circle in the lightest lift as long as possible. Often with my hand launch I will try to locate lift until I catch the plane, then quickly throw back where lift was spotted and proceed to climb out. When the plane is circling 15 feet high chances of climbing out are not very good, but you can easily see what is going on with your plane.

Location, Location, Location

As important as location is in real estate, so is finding the exact location of the thermal core. If you are not flying in lift, it doesn't matter how efficient your glider is or how smoothly you are flying. Even though your sailplane is gaining altitude, it might not be in the strongest part of the thermal. The "Secrets of Thermal Soaring" video from Radio Carbon Art diagramed the strength of lift by assigning numerical values to lift or sink, with sink represented in negative numbers. If your plane is flying in the lower number positive lift, it is very close to the negative number sink. Working toward the strongest lift increases chances of avoiding sink.

Putting It All Together

I hope these suggestions might help you improve your thermal flying, at least a little. Nothing earth shattering here, but if you work to improve all the small components, it can add up to big results. ■

GORDY'S TRAVELS

Ten Tips That You Have Found Lift!

Gordy Stahl
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Pretty often during my travels to your flying sites, I notice that pilots often launch through lift, fly through lift, fly away from lift or circle on the edge of lift... That's okay if I am flying against them in a contest, but mostly it's frustrating because I know I have done it for years myself.

With all my flying you'd think that I would never miss my times or a landing but, in fact, like most of us mortals, sometimes I head the wrong way too or do a dumb thumb on approach.

But one of the benefits of flying so often is that my frustration inspired me to identify cues and hopefully be able to explain them to the rest of us - not something the soaring legends are good at. They're great sailplane pilots but not very often talkers.

So let's talk!

Devise a flight plan

Prior to launching (and this assumes you have read and put into practice the things I have written prior about trim, balance and its effects on reading air) take a look around the flying site. Look for the obvious signs like birds circling, dust devils, big dark clouds, or one group of trees moving on a tree line. Look for a tilled black field, or a big building that might be collecting heat. Duh, look at what other planes are doing, but don't count on them to go to lift. Watch their travel path to see what kind of air they are passing through, as in did you see them wobble, or perk up their tails, or get sluggish and droop tailed? Take the wind speed into consideration too; it could mean that, once in lift, you will have to aggressively bank and crank, with tight moving circles to stay in the core.

Once you have noticed all you feel you can, make a search pattern plan, and follow it. It's a big 'Duh!' if the plane before you went left and it sunk like a rock, pretty much assured of a spectacular one minute flight; you should choose a right turn off of launch.

If there is a gaggle of planes in great lift, definitely do a 'turn and burn' off of the launch to get over that way. Once there, don't be in a rush to get right in with them. Move past them to see if they are really just on the front edge of the core, or the back edge. If heading to a gaggle, do not take your eyes off of your plane, and advise your timer to do the same. It's easy to lose which model is which.

Recognizing lift

If you read my previous articles, this part is redundant, but important. If your model is balanced (As opposed to, "I set the CG according to the plane with a micrometer.") then when it is in lift it will signal and confirm. It will signal via the tail popping up and the controls getting really lively. Once you feel that is the case, then by simply hitting your rudder either direction your plane will circle upwards if there is lift, or downwards if you are in sink. Your controls get lively because there is air (energy) rushing up underneath for your plane to slide forward off of. They become sluggish because there is cold air dropping on top of your plane's tail, sticking the nose up, slowing air moving over the control surfaces.

If your model is 'set dead on the CG according to the plan' chances are it will not signal or confirm anything other than the fact that you will be getting skunked on that flight.

Launching into lift

You can tell that you launched into lift because your wings ripped off. You can tell you launched into lift by the sound of the winch really laboring. You can tell you launched into lift because your launch was really vertical and your altitude seems really good.

When you hit lift on a launch, don't lay on the pedal! Kite your model up

instead taking all the line in, more line out – more altitude on release. Fast, short duration tapping, just to keep the line taunt (sort of like keeping beat with your foot to a fast Polka.

Only stand on the pedal at the very top of the launch, then let off and just pull your plane up AFTER you let off the pedal – do not bother with going in the 'bucket' with a big dive and pull up.

Once off, circle search the area for a signal, then ask for confirmation by hitting rudder. I know that rudder thing has you freaked because you've never touched it except accidentally, but you paid a thousand dollars for what you think is the most trick airframe design out there, loaded it up with really expensive servos, yet don't use one of the most important parts of it: the rudder. So get your thumb on that left stick and leave it there! Force yourself to go back and re-read my article on "Balance, and Hang Tail and Return to Balance and Trim", then start looking for lift, leading with your model's rudder. You paid for your whole radio. Start using it.

Finding the Core

When your model indicates lift, don't just stop and turn, search the shape and edges of that thermal. Doing so will tell you which direction it's moving or if it's moving at all. That means taking a few seconds to fly flat and straight till your model gets sluggish, then turning 90 to see what's over that way. Once you feel that you have 'felt' it out, then dig back into the core area.

Use ALL of your Radio!

Once in lift, get to work with switches and levers. Since you paid for your trim levers it's silly to just set them and then let them rust in place. They get lonely and need lots of attention just as both control sticks do.

One question I always ask a pilot I am timing for is, "Wouldn't you rather your plane was falling upwards instead of downwards while in thermal turns?" Too often guys are doing a bow-tie pattern of circling because they don't take advantage of their elevator trim lever. Why not crank in some up trim when you hit lift, then control your model's nose by working in the needed down stick to keep your plane from slowing too much, but all the time working up?

Camber too! There's never a better time to dirty your plane up with about a 1/8" of full trailing edge camber than when you are in lift. Like I said, just watch the nose to keep your plane moving along, instead of porpoising.

You'll be surprised how you suddenly start adding a minute to every flight!

When it's time to head down for your landing approach, take that added up trim and camber out. In fact, add a click of down trim in for landings; it's a lot easier to fly through a ground thermal than it is to correct for a surprise nose pop up on approach.

Lift is:

Energy, same as jet fuel. With it your model is active, responsive, nimble, perky, quick and FUN.

Sink is:

Iron poor blood, sloth-y, un-responsive, weird acting, tail hang-y, stall-y, slow, up for sale.

A Final Tip

You know you have found lift when your model tells you. IF you have your model balanced for flying versus some misguided lead filled nose idea that a model is 'more stable' when it has a snoot full of lead, its tail can pop up when the slightest amount of lift blasts up under its tail. But even with a perfectly balanced model, YOU need to be watching for that invisible rising energy that will super charge your controls (go back and read my article on "The Hunt").

That means as you fly along you can't just sit there and hope lift hits you on the noggin; you have to be looking and testing all the way away, bumping rudder to see if there is a response.

What happens if your rudder doesn't seem to do much on YOUR model? Your expert friends would advise you to install a bigger rudder, but don't! It's the lead in the nose that stops your rudder from having the strength to move your plane's nose. Get your model balanced, reduce your control throws to settle the improved reaction, and watch your plane tell you the "Ten Tips That You Have Found Lift!"

See you next trip!

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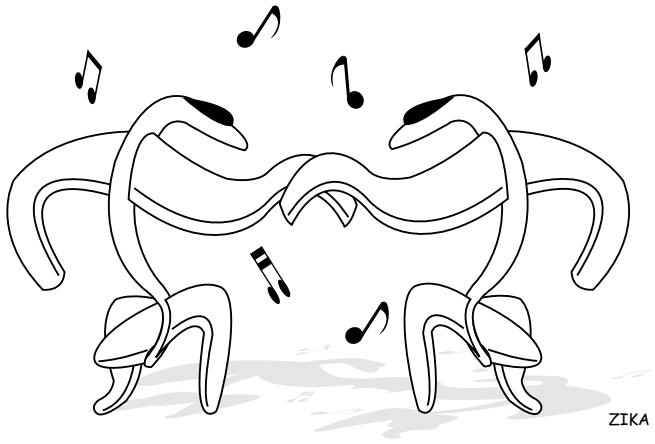

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Reference Material

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

BBS/Internet

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

International Scale Soaring Association

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

web site: www.soaringissa.org

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

T.W.I.T.T.

(The Wing Is The Thing)

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

T.W.I.T.T., P.O. Box 20430
El Cajon, CA 92021

www.twitt.org

Sailplane Homebuilders Association (SHA)

A Division of the Soaring Society of America

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

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

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

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

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

Send for your aspirant form, today:

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

http://www.silentflight.org

The Vintage Sailplane Association

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

Vintage Sailplane Association
1709 Baron Court
Daytona, FL 32124 USA

ESL

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

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

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

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

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

Full Size Announcement
& R/C Invitation

2003 Eastern Workshop

Friday, June 20 through Sunday, June 22
Ridgely Airpark, on Maryland's Eastern Shore.

At this year's workshop the emphasis will be on flying, sharing sailplane-building experiences and techniques, and just hanging out together. We will have a few technical presenters and as many kit-providers and builders as we can muster, but there will be more time for flying and talking with friends. Come with plans and bits and pieces of what you're working on—or a flyable finished product: just let us know what you're bringing. Please return the tear-off portion of this notice as directed below.

Ridgely Airpark: (1N0) Location, 2 miles NE of the town of Ridgely, MD. Coordinates: N38-58.21, W075-51.98. Tel: 410-634-2806, hours 8am-dusk daily. Elevation 63. Pattern altitude 1045 MSL (all aircraft). Runway: 12-30 2710x95, turf; lights, PCL; obstruction, trees rwy 30. Approaches: (VFR). FSS: Leesburg 800-992-7433. Frequencies: UNICOM 122.8; CTAF 122.6. Charts: Washington sectional. Notes: parachuting.

Lodging (there is camping at the airfield: please prearrange with us):

Slo Horse Inn	1649 Holly Road, Greensboro, MD (10 min to arpt)	410-634-2128
Riverside Hotel	N. Main St., Greensboro, MD (15 min)	410-482-7100
White Pillars Inn	206 S. Fifth Ave., Denton, MD (15 min)	410-479-3292
Queenstown Inn	7109 Main St., Queenstown, MD (20 min)	888-744-3407
Holiday Inn Expr.	1020 Kent Narrows Rd., Grasonville, MD (20 min)	800-465-4329
Comfort Inn	3101 Main St., Grasonville, MD (20 min)	800-228-5150
Sleep Inn	US 301/50, 101 VFW Ave., Grasonville, MD (20 min)	800-753-3746
Econo Lodge	81175 Ocean Gateway, Easton, MD (25 min)	800-553-2666
Holiday Inn Expr.	8561 Ocean Gateway, Easton, MD (25 min)	800-465-4329
Days Inn	7018 Ocean Gateway, Easton, MD (25 min)	800-329-7466
Comfort Inn	8523 Ocean Gateway, Easton, MD (25 min)	800-228-5150

For information contact: Dave Hudnut, 610-584-6691 (dhudnut@juno.com),
Al McCarty, 215-453-7602 (almccarty@easy-pages.com), or
Tom Blevins, 207-882-6396 (tomblevins@gwi.net).

fee: Pre-registration (til June 10):

member & family	$25	(meal costs not included)
non-member & family		$30
Registration at the door:		
member & family	$35	individual, one day: $17.50
non-member & family		$40

Make check payable to Sailplane Homebuilders Association (by June 10). Send to:
Dave Hudnut, 951 Harleysville Pike, Schwenksville, PA 19473

Name:_____ phone:_____

address:_____ e-mail:_____

_____ member of (circle): SHA, SSA, VSA

I'll be bring my sailplane [ ] Yes [ ] No Type _____