

October, 2000

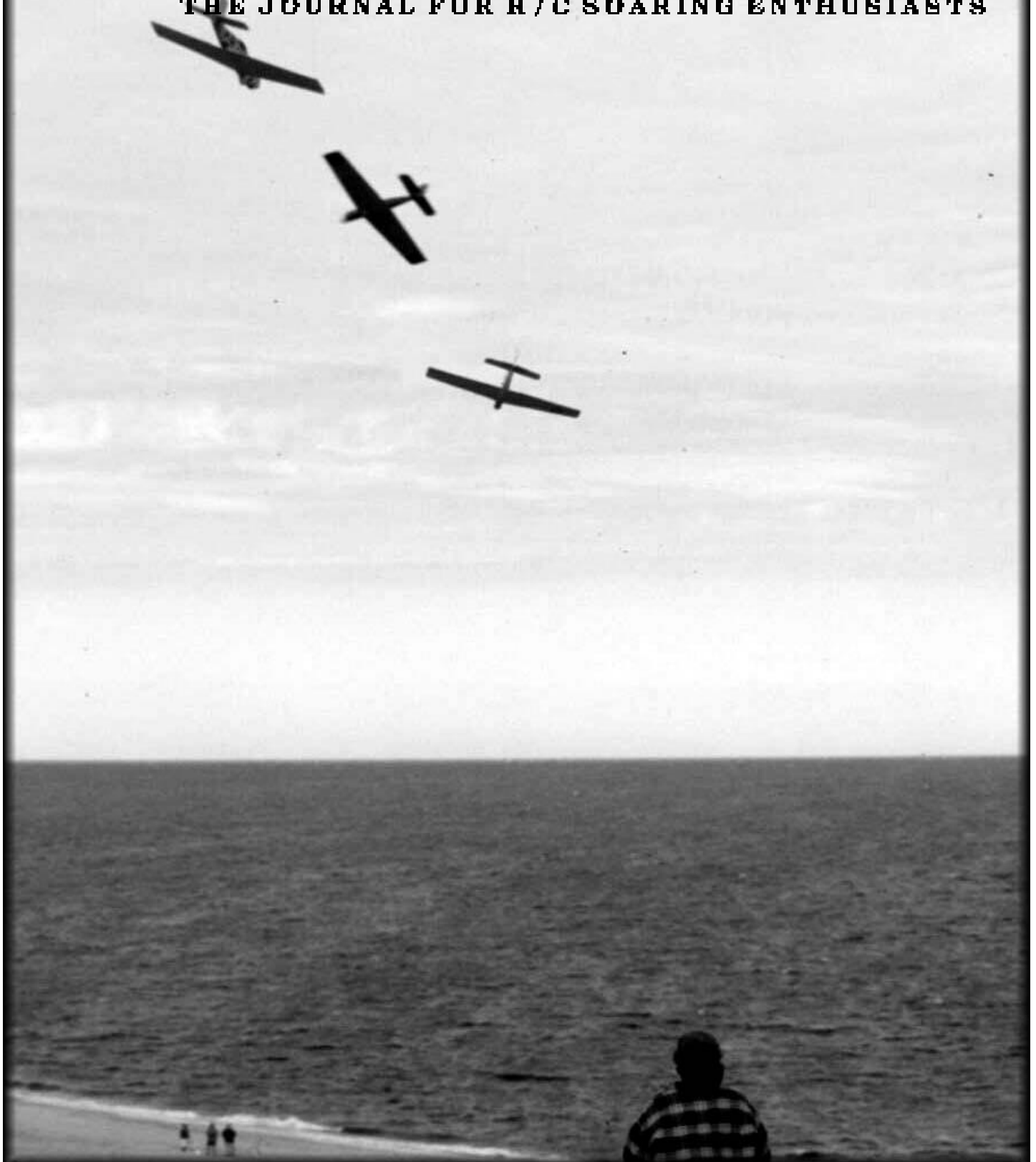
Vol. 17, No. 10

U.S.A. \$3.50

**R/C**  
**SOARING DIGEST**

*Radio controlled*

THE JOURNAL FOR R/C SOARING ENTHUSIASTS



# R/C Soaring Digest

Radio controlled

THE JOURNAL FOR R/C SOARING ENTHUSIASTS

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### AIR COMBAT!

Dave Garwood reports on slope foamie combat tips: preparation, strategy, and tactics.

Photography by Dave Garwood, Scotia, New York.

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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who designs the unique ZIKA clip art.

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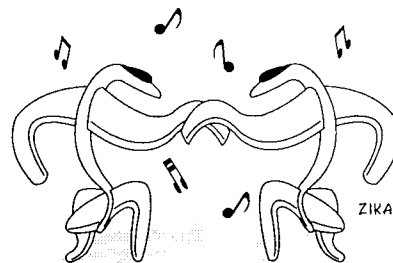
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..... "The Square-Cube Law and Scaling for RC Sailplanes" by Dr. Michael Selig

..... "Modifying & Building the MB Raven (Parts 1-4)" by Bill & Bunny Kuhlman

**Bookshelf Listings** - A listing of recently published books of interest to aeromodelers.

**Complete RCSD Index, 1984-1999**



# The Soaring Site

## Elmira 2001 Update

*What follows is an update on Elmira 2001, or rather 2002, from John Derstine.*

### To all scale aerotowing enthusiasts:

"Over the last five years, aerotowing has seen a tremendous growth in popularity throughout the USA. Paralleling this growth was the Elmira Aerotow. Every year we tried to grow the event and make it the best scale event it could be. We had no idea that our first meeting in 1995, attracting all of 25 pilots to our local flying field, would evolve into one of the biggest and most successful events of its kind in the USA, and perhaps elsewhere. The pressures of putting together this event every year have led us to consider the following.

"Our demographics tell us that majorities of the pilots who attend Elmira from a distance of more than 1,000 miles tend to skip every other year, attending biannually. Allowing 85 or more R/C pilots to fly with full scale aircraft in the vicinity have caused us to have concerns about safety and, unfortunately, its evil twin, liability. Pressures on the venue, Harris Hill Soaring Corporation, and ultimately our small club, have caused us to come up with the following decision.

"We will not continue Elmira as an annual event but will take a year off to regroup. Between now and the summer of 2002, we will be looking hard at ways to make the event more flyer friendly than ever. We feel that the event, while exciting at the outstanding Harris Hill venue, may need to be located at a model specific venue, or perhaps multiple venues. A biennial schedule may eventually be adopted. I will solicit views and ideas from anyone who has a desire to share his or her opinion. Indeed, I have already spoken with many on the very issues stated above. The bottom line is that I cannot devote as much time as needed to make this happen for next summer.

"My apologies to those whom this might cause inconvenience regarding vacation schedules, etc. The good news is that I may get to fly more, and actually attend other events, of which there are now many. "Have tug, will travel!"

See you at the field,  
Best regards,  
(signed) John Derstine  
johnnders@ptd.net

### Back Issues

*We have received an abnormal number of requests regarding the availability of back issues. One such message this last month was regarding the subject of 'aerobatics'.*

Mike, a subscriber in Oregon asked, "I understand from Gordy on RCSE that Robin Lehman discusses aerobatics in back issues of *RC Soaring Digest*. Please let me know how to obtain copies."

Yes, Mike, Robin has been writing for RCSD for several years on the subject of large scale. In October 1997, he started a series on aerobatics: 'Aerobatic Flight Plan'. The series was intended to ease a person into aerobatics, starting with some easy routines first: straight and level flight. The series concluded last year.

First, I would recommend that you download the RCSD index from our web site, if you haven't already. The key words to search for are: Robin Lehman, or aerobatics.

Then, let me know if you have any questions, how far back you'd like to go in the series, or if you want some of his earlier articles, as well.

The cost is \$2.50 for each back issue. However, I might not have all the issues available that you'd want. In that case, I'll be happy to reproduce them for you, if you like.

*For any of you who wish to obtain back issues, simply send me a note or e-mail if you can, just like Mike did. I'll try to fill any requests and, yes, will even reproduce specific articles for you if you really want them.*

### Late Again!

The old time clock says we're quite a bit off the old schedule, and an apology is in order. So, sorry folks!! We've got a zillion excuses, which **does not** include phasing out RCSD! No matter what some folks may say!

Just about the time we plan to catch up, something major comes along. This last month, for example, I needed to do a major overhaul on computer software, and 'Murphy' zeroed in for a bit of fun, at my expense! After a tug of war that lasted the best part of three weeks, our faithful Power Macintosh is responding nicely, having been treated to new utilities, software upgrades, and a beautiful aquarium full of fish serving as the screen saver. While I'm not finished, everything should be running smoothly by year end.

On another front, behind the scenes, the RCSD Team is reviewing our path forward. Sometimes we have writing blocks while attempting to figure out what folks would like to read about.

*In one piece of e-mail between the team, Bill & Bunny (B<sup>2</sup>) suggested the following:*

"The results of our over lunch conversation netted the following items which you may want to pass on to "the group" for expansion and as a jumping off point for future articles and columns. Perhaps it may also be used backwards to find potential writers.

"Based on feedback from readers, including the questionnaire which went out several years ago, we believe RCSD content is most appreciated when it falls within the following one or more of three major themes. We've noted that each major topic begins with the letter "T," and so we've already started calling them "the three T's."

- (1) Theory,
- (2) Technology, and
- (3) Techniques

"Theory (what is possible) can be

broken down into a number of sub-topics, like aerodynamics, structures, meteorology, and perhaps chemical. Technology (what is being accomplished as the result of theory) includes aerodynamics, materials and electronics. Techniques (how to best use specific technologies) can describe design and construction techniques, and ways to improve flying skills."

*Thanks Bill & Bunny!*

As most of you know, we've been focusing pretty much on 'The Three T's'. However, there are some subjects which we would like to have covered, and have been searching for folks to 'volunteer' their expertise and share it with the rest of us. Two such subjects which come immediately to mind are: scale and hand launch.

Some of you may ask, "Scale? Doesn't Robin cover that subject?"

As of this month, Robin has retired from writing, due to lack of time. We wish him luck and thank him for all the time and tremendous energy he has donated to our wonderful hobby! For any of you that wish to thank him personally, he can be reached at his web site:

<http://www.sailplanes.com>

*Thanks, Robin!*

If any of you would like to try your hand at writing, just let us know!

### R/C Soaring Resources

Back in June, we asked that the 'R/C Soaring Resource' section be reviewed for accuracy by any of you that have a listing or have identified an incorrect listing. First, thanks to all of you that responded with changes. It is appreciated!

Second, this month, the listing will be treated as an insert. In the future, we'll print it, as necessary, as an insert, but also provide a copy to new subscribers as they 'check in'.

In the meanwhile, the list will be made available as a .pdf document, which can be downloaded from our web site. As updates and changes are received, the .pdf file will be updated.

### Format Changes?

Yes, there are numerous changes this month, and we hope you like it! Our intent is to continue to focus in on 'How To' material, the 'Three T's' and to do the layout in such a way that the material is easier to read. Yes, there are less pages, but most of those lost were from the 'Resource Section', ads (event & business), etc.

At some point, around the first of the year, we hope to take RCSD on-line, available to subscribers as a .pdf file. Of course, nothing is set in concrete and there are many issues that need to be addressed.

As most of you realize, RCSD is a specialty publication and not one that anyone can make a living at. However, there are expenses generated, whether we go on-line or not. So, one issue is whether or not we'll charge for subscription access. It is possible that advertisers could provide the difference by electing to become sponsors. If enough advertisers paid for sponsorship, then this will affect our final decision.

In any event, for those of you with on-line access, your subscription costs will be reduced, regardless.

And, for those of you who still wish to obtain a printed copy? We plan on business as usual, realizing that not everyone has on-line access.

### Murphy's Back!!

Murphy made another quick, unscheduled visit on Veteran's Day, stopping our press work on a whim. While ignoring his antics, as the repair person put in an appearance in order

to undo the havoc that Murphy had done, I found myself doing the mail. There was a wonderful letter from subscriber Tom Tock, of Dwight, Illinois, that I wanted to share.

*Tom says:*

"Enclosed is my check for a renewal subscription to your good magazine.

"I've been flying sailplanes since 1975. The magic of silent flight, the thrill of going up in a thermal, has never diminished, even though my talents for doing so may have. Recently, at the grade school field where I fly, I was launching and thermalling my Predator while standing in close proximity to my Caravan.

"Yanni was on the van's tape player, and I was happily listening to the music and thermalling along at about 800 feet when I was joined by two hawks, one above the Predator, one below.

"They circled with me for a couple of minutes before I realized I was smiling. The hawks, the music, the thermal - well, it may have been the most satisfying flight I ever experienced.

"If it sounds like I'm getting old, and I am, 68, so be it. I know I'm old enough to appreciate the finer things in life, and this, for me, was certainly one of those moments. What a great sport."

*Thanks, Tom! You made our day!*

And, Readers, that's what we're all about! We plan to continue to provide you information on the subject of sailplanes for a long time to come!

**Happy Flying!**  
**Judy Slates**



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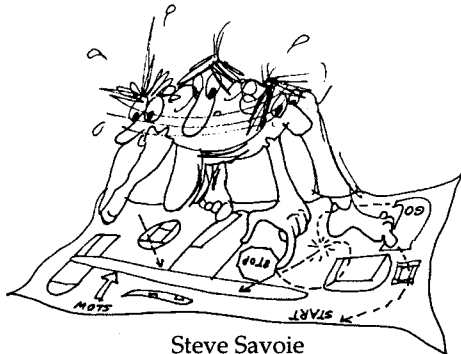
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## "SHORT CUTS"



Steve Savoie  
926 Gage St., Bennington, Vermont 05201  
(802) 442-6959

### SHIP IT!

I found out quickly that shipping my U-2 and P-51 to Soar Utah and checking my DAW 1-26 in baggage on American Airlines was no easy task without a bit of pre-planning. This was quite a learning experience, which I want to share with you readers. Luckily, I had help with this endeavor from Dave Garwood and a few local frequent fliers who routinely ship their planes to events throughout the US.

First off, you need to build a good shipping box of adequate size, no cardboard please. The second thing you need to do is find the maximum dimensions the box should be, in order for your favorite aircraft (and goodies) to fit. I called around and found out that the best size to use for a DAW standard size warbird is 36" x 9" x 40" **if** you unhook the elevator linkage and let the elevator go vertical. Now remember this: **You will not save on shipping costs by building a light weight (cheap) box!** The boxes for the maximum UPS shipping dimensions we use are primarily costed out per size (not weight), within limits, of course.

So, let's assume I'm shipping the DAW box from Bennington, Vermont to Chicago, Illinois and the box, with plane, weights 7#. The cost is \$18.84 without any additional charges like insurance, COD, etc. That same box, weighing 40#, costs \$18.84, and remains at \$18.84 all the way up to 70#! So, build your box strong, using good 1/8" or 1/4" plywood; some folks even use 1/8" birch plywood! And remember to build strong corner joints. A good combination of wood screws and wood glue works well. If hinges are used, make them continuous hinges and low profile so the box

doesn't hang up on belting or other boxing while being sorted and shipped. Better yet, some folks have used old leather belts, screwed to the box and cover, as a hinge.

I would not recommend a padlock and hasp because padlocks are too easy to cut and will hang up - so just use a lot of screws. Some folks even take a light weight, cordless screw driver with them just to open up boxes. One thing many folks do is to permanently mark their return address on the boxes and tape them over during the 'shipping to' process. Once they are ready for the return trip, simply remove the tape and ship them home. So, let's say you've got a box built.

### How do you support the plane?

Do not tightly pack the plane in because any flexing of the box, and it will happen no matter what you build, will get transmitted directly to the plane and break it. The best way around this is to build a support cradle under the fuselage and wing tips, placing vertical spacers cut from blue foam (2x2) between the plywood panels. It's best to anchor some cup hooks and use wide elastic material to tension the plane against the cradles. A nice, wide material is waistband elastic from a sewing store; it's wide and some variations have padding on them.

### Transmitters and (stuff)?

So, what are you going to do with your transmitters and (stuff)? You might ask, "If the weight limit has not been exceeded, why not ship them all in the same shipping box? What good are the two apart?" This way, if one of *two* boxes is late in shipping, you are only down one plane. Just image all the transmitters in *one* box and that's the one late. And, of course, it's easy to place *other* goodies in the shipping box, wrapping them in soft padding and placing them in a large ziplock bag - simply billow it up with air and seal it tight to cushion the goodies.

So, everything's in the box. Next check: Were all transmitters charged and in the OFF position? Better recheck. Don't forget to bring a charger, power strip, and at least one extension cord. Remember, when you turn off the lights in your motel room, to check that the power to the chargers is still

on - yes, it happened to me once, and I paid for it the next day.

### Timing?

I suggest shipping everything out at least 8 days in advance, so the boxes arrive the day before you do; of note, most deliveries are in the afternoon. Many hotel managers will allow you to store your goodies if they arrive one day before you do, but let them know ahead of time *and* let them know you appreciate it.

### So, what about insurance?

Packages sent via UPS come with \$100 of insurance automatically. If you want more insurance, then it's \$.35 for every additional \$100 of coverage, which is really not a bad deal.


And speaking of money, how are you going to pay for this? UPS will take a local check as well as a money order, and you can call in advance for your pick ups, both going out and returning. I believe they will also take plastic via the internet, too.

### UPS Web Site

The UPS web site is a great asset of information. For this article, I just typed in my box dimensions, weight, from and to addresses and was quoted the price. You can arrange pick up via the web site (<http://www.ups.com>), as well as through their 800 number:

So, plan ahead, because as I quickly found out, if your box dimensions are 1" over the maximum UPS limits, it could make the difference between a one way shipping cost of \$28 via UPS and \$168 via truck (not UPS).

Happy Shipping! ■

<p><b>Xenath</b> 112" LMR Class A and B Sailplane.</p>  <p>Wingspan: 112 in. Wing Area: 905 sq/in Wing loading: 12 to 13 oz/sq ft Flying weight: 73 to 78 oz. Altitude: 30700 ft Radio: Computer, 6 mic. servos. Power: .85 Geared. \$549.00 Retail, Plus Shipping</p>	<p>CSD is offering all new design for Class A &amp; B Sailplane. The Xenath (Named after the MCA/Universal television series "Xena: Warrior Princess") was designed with an emphasis on soaring first. The Xenath fly's like an open class contest ship. The Xenath is an all vacuum bagged 2lb Blue foam wing with carbon reinforcement. Other pictures of the Xenath can be found in DEC 99 page 58 in Model Aviation, Ron Scharck is holding the Xenath and page 96 of SAE Modeler Jan 2000 issue. Also, if you would like to "see" the Xenath check out the new video "Electric Airshow."</p> <p><b>Covance Sailplane Design</b></p> <p>Phone: (909)485-0674 <a href="http://members.aol.com/rcav">http://members.aol.com/rcav</a> e-mail: <a href="mailto:rcav@aol.com">rcav@aol.com</a></p>
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## The Blackbird 2M Project

After more than twenty years of building tailless sailplanes, we've come to the conclusion that the greatest "bang for the buck" is the Blackbird 2M, a Dave Jones design, once available through his Western Plan Service.

In all, we've thus far built six renditions of this design: two of them per plans 2 meter, 78.5" span; one RC-HLG of 59" span; one foam core version of 90" span (formulated to take advantage of all winch power); and two XC monsters of 107" span and maximum FAI wing area, 2325 in².

These aircraft, particularly the original Blackbird 2M, build rapidly, take little in the way of materials considering their overall size, and are quite maneuverable for both thermal and slope flying. The low aspect ratio gives a good speed range and a very light wing loading, and they thermal easily. Because they lack lower surface flaps, landings are done at relatively high speed. If it were not for this characteristic, the two meter version, built per plans, would make an excellent contest 'ship in the AMA two meter class!

We have now started building our seventh Blackbird. Some changes are being made to the structure and to the aerodynamics in light of previous experiences with this design. This

month we're going to cover all of the various modifications which will be incorporated into the finished model.

## Airfoil

The original Blackbird 2M incorporated the CJ-3309 section. This is an airfoil of 9% thickness which has 3% camber with a high point at 30% chord. One the advantages of the CJ-3309 is that the lower surface is flat from just behind the nose radius to 75% chord. This makes construction a breeze. The CJ-3309 performs well if the model will be used for thermaling, but due to the flat bottom and relatively severe reflex, it just cannot fly fast. As well, any inertia gained during a zoom from a winch launch is rapidly dissipated into airfoil drag rather than into terminal height.

Our second Blackbird 2M and both of the XC versions incorporated the CJ-25^209. This airfoil is a big improvement over the CJ-3309. The thickness remains at 9%, but the camber is reduced to 2.5% and the high point is moved forward to 25% chord. This reduces the needed reflex and the drag is significantly less as a result. Additionally, this airfoil incorporates what has come to be called a "Phillips entry," so the lower surface is flat over a shorter distance - from 25% chord back to 75% chord. The wing structure can still be built on a flat surface without resorting to complex jigs, but the result is again less drag.

We became very excited about the BW 05 02 09 section while building the modified Model Builder Raven, and just could not wait to try it on the Blackbird planform. The BW 05 02 09 section is the work of Barnaby Wainfan, famous for his free flight designs and the full size "Facetmobile." This section was originally an option airfoil for the

Raven S, the last of the Raven series. The BW 05 02 09 has just 2% camber with the high point at 30% chord. The lower and upper surfaces of this section are curved over the entire chord, so the wing structure needs some sort of jig for proper alignment during construction.

## Elevon design and structure

The original Blackbird 2M plans show an elevon with a Frise-type structure. That is, the hinge point is some distance behind the leading edge of the surface, and as the surface is deflected upward the leading edge protrudes from the bottom surface. The upper surface remains smooth regardless of deflection.

There are two difficulties with this control surface. First, it causes drag any time the surface is deflected upward. The idea behind the design is to control adverse yaw when applying aileron. However, the additional drag created when applying up elevator is substantial and unnecessary. Second, we've found that rather than reducing adverse yaw, the Frise-type elevon design causes so much drag that proverse yaw appears.

In flight, these two difficulties are immensely evident. When the transmitter stick is moved to roll the aircraft to the right, the Blackbird does not roll at all. It does, however, yaw to the right. In fact, if you move the aileron stick from right to left and back again, the Blackbird will swing somewhat violently in yaw, with no rolling motion in evidence. The glide ratio is of course much worse under this condition. Additionally, the added drag of two protruding surfaces in the lower surface airflow grossly affects aircraft performance during up trim conditions and when applying up elevator in a thermal turn.

Our first modification to eliminate the Frise-type surface included use of a MonoKote hinge at the upper leading edge of a conventional angled leading edge elevon. This change very much improved performance. Proverse yaw is still noticeable, but it is certainly not so severe as before, and there is no protruding surface when up elevator is applied. Blackbird #7 will use a MonoKote hinge on the lower surface, as the 90" span version successfully employed. We'll explain the improved

## STREAMLINES

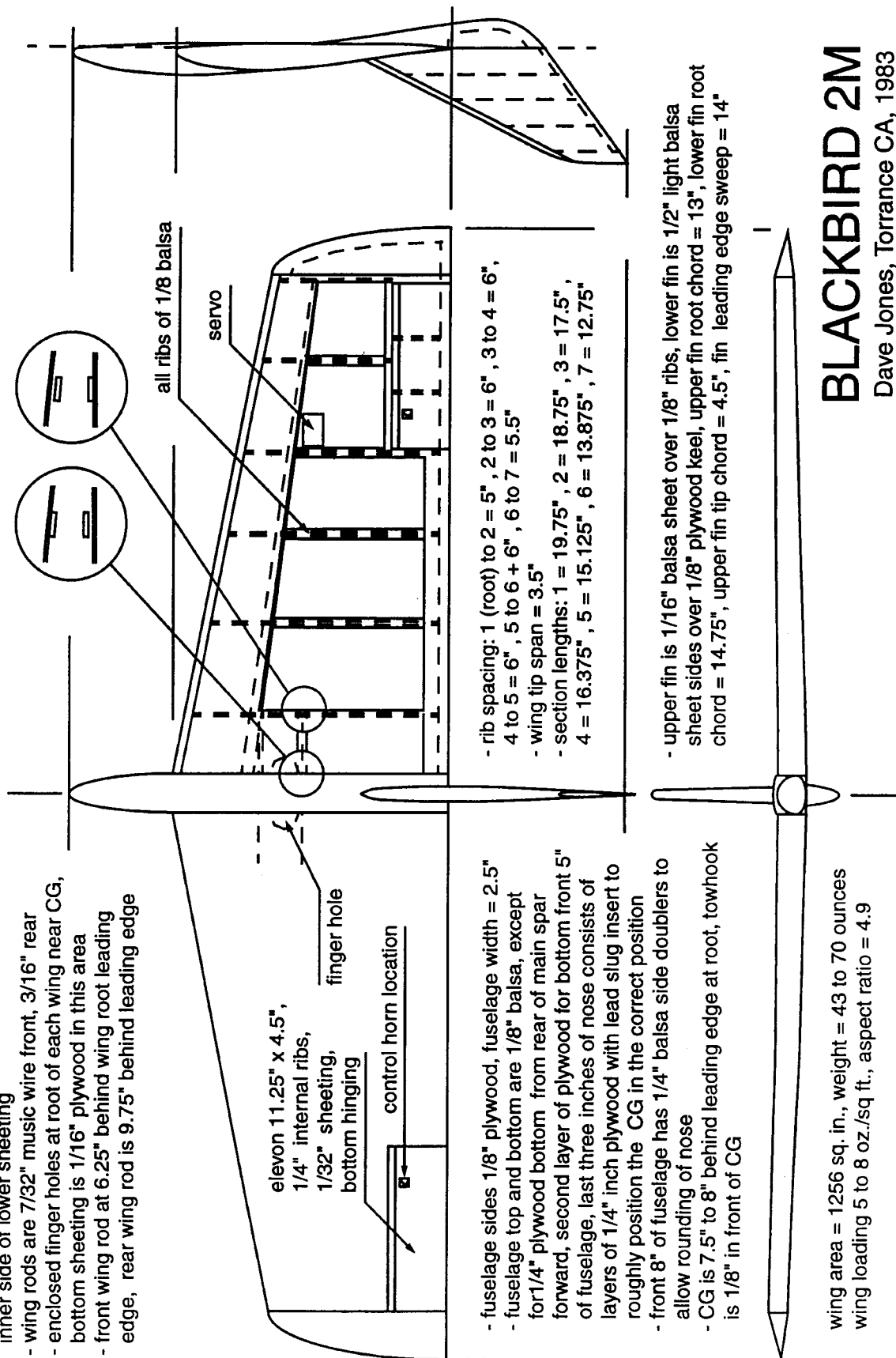
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- all sheeting and cap strips are of 1/16" balsa
- cap strips are 1/2" wide
- wing leading edge 1/2" x 3/4" balsa
- 1/64" plywood at trailing edge of wing and fin
- wing tips have a core of 1/16" plywood glued to inner side of lower sheeting
- wing rods are 7/32" music wire front, 3/16" rear
- enclosed finger holes at root of each wing near CG, bottom sheeting is 1/16" plywood in this area
- front wing rod at 6.25" behind wing root leading edge, rear wing rod is 9.75" behind leading edge

- spar caps are 1/2" x 1/8" spruce, tapering to 1/4" x 1/8" at wing tip.
- 1/16" plywood spar faces through first and second bays, then 1/8" vertical grain balsa web in bay 3 and 1/16" vertical grain balsa webbing through bays 4, 5, and 6



- fuselage sides 1/8" plywood, fuselage width = 2.5"
- fuselage top and bottom are 1/8" balsa, except for 1/4" plywood bottom from rear of main spar forward, second layer of plywood for bottom front 5" of fuselage, last three inches of nose consists of layers of 1/4" inch plywood with lead slug insert to roughly position the CG in the correct position
- front 8" of fuselage has 1/4" balsa side doublers to allow rounding of nose
- CG is 7.5" to 8" behind leading edge at root, towhook is 1/8" in front of CG

wing area = 1256 sq. in., weight = 43 to 70 ounces  
wing loading 5 to 8 oz./sq ft., aspect ratio = 4.9

## BLACKBIRD 2M

Dave Jones, Torrance CA, 1983



elevon structure in more detail in another installment.

### Spar structure and wing rods

The per plans spar structure consists of an upper and lower cap of 3/8" by 1/8" spruce with vertical grain balsa webbing. We've always modified the caps so they taper from 1/2" by 1/8" at the root to 1/4" by 1/8" at the tip.

Both wing rods are specified on the plans as being 3/16" diameter. We've always increased the forward rod to the next larger diameter music wire, 7/32".

The resulting spar and wing rod combination, along with the very thick wing root and limited span, makes full power winch launches not only possible, but a true joy. The zoom off the launch always gets ooohs and aaahs from the modeler audience, and is quite astounding considering the wing is nothing more than the standard D-tube and open bay structure.

### Servo placement

Our first Blackbird 2M utilized NyRods to connect the servos, mounted in the fuselage, to the elevons. Due to the 90 degree bend in the conduit, there was a lot of play in the system which could not be removed. The elevon centering was always dependent upon which way the servo had last moved. Additionally, the servo arm could rotate without moving the control surface at all. Subsequent Blackbird construction projects, independent of size, have the servos placed in the wing with direct straight connections to the elevon control horn. The Blackbird described in this article will utilize Volz WingMaxx servos mounted near the inner edge of the elevon.

### And in future installments you'll find...

As we write this column we're already well into construction of Blackbird #7 and have the fuselage completed. The wings require the upper sheeting of the D-tube and cap strips, plus the usual sanding of the leading and trailing edges, etc. We're planning to have the model completed by the time you read this column.

Next month's column will provide

information on the BW 05 02 09 airfoil which we'll be using on this rendition.

The third installment will include construction hints based on our previous experiences with this design, photos of the building process, drawings of the various specialty parts which will be needed, and other items which RCSD readers should find both interesting and motivating.

Test flying will of course depend on weather, so any delays in the printing of the final installment will not be our fault!

Comments, questions, and suggestions for future columns may be sent to us at either P.O. Box 975, Olalla WA 98359-0975, or <bsquared@halcyon.com>.

### Resources

Jones, Dave. Blackbird 2M (full size construction plans). Western Plan Service, 1983. (We are not aware of a retail source for these plans at the present time.)

Kuhlman, Bill & Bunny. Goliath. RCSD, February 1988.

—. Notes on "planks." RCSD, October 1989.

—. Suggestions for first 'wings' - part II. RCSD, March 1991.

—. How "planks" fly. RCSD, March 1992.

—. Aileron differential: some possible effects on performance. RCSD, August 1992.

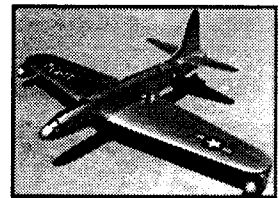
—. A possible solution to adverse yaw in plank planforms. RCSD, May 1996.

—. Modifying and building the MB Raven. RCSD, June through September 1999.

Note: All of the above articles, except for MB Raven, are available as reprints within the two "On the 'Wing... the book" volumes available from B<sup>2</sup>Streamlines. ■

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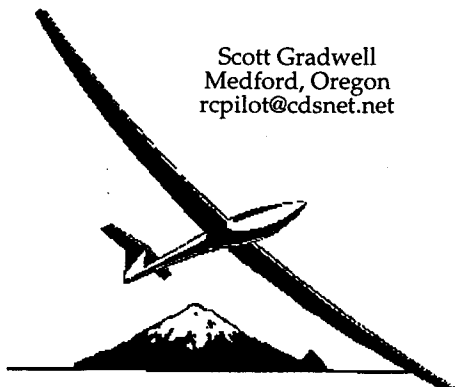
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## CROSS COUNTRY SOARING

Scott Gradwell  
Medford, Oregon  
rcpilot@cdsnet.net



### Visalia Fall Festival

I went to Visalia this year and had a very good time. I wasn't planning on going until I overheard a few club members talking about it; I spoke up saying I would go, also. It was one of those times when you think about it a little later and wonder what you have committed yourself to...

At the time, all I had was an Oly II and a SB/XC. Neither of them is ideal for open class TD contests. I called RnR and ordered a Millennium because I really like the SB/XC. About a month before the contest, I was starting to get nervous, but it finally showed up. It didn't take all that long to get it in the air and I actually was able to fly it twice before I went down to Visalia.

On the way down to Visalia, we stopped at the Castle AFB Museum in Atwater, California. It was definitely worth the stop and, if you are ever passing by on highway 99, you'll have an opportunity to see a B-17, B-24, B-

25, A-26, B-36, B-47, B-52, and more.

Saturday morning we had a pilot's meeting and immediately after, started flying. It runs like a machine down there - it has to; there are almost 300 pilots flying 4 rounds each. I learned quickly that, in order to get landing points, it helps to have a skeg. I still think skegs are not a natural part of soaring, but I didn't want to drive that far and do poorly just to make a point.

I am sure you are wondering what this has to do with X/C soaring, so I will try to tie them together. First, obviously, the more you fly the better you will fly. Especially when you are flying in a high pressure situation where you have to work light thermals. A lot of times when you are out on course and you get down low, you will have to work light thermals and, many times, if you can stay with them long enough, they will build into a larger thermal that gets you back on course.

It is also good practice to fly in high pressure situations so you can get more comfortable and not let your nerves interfere with your flying.

Visalia is also a lot more than just flying; it was nice to see old friends and meet new ones. I really enjoyed being able to browse the vendors. I am definitely looking forward to next year. While I was down there, I was able to talk with Tom Hoopes and he said he might be able to convert more Multiplex Helios varios. I will let you know

as soon as I know. I also wanted to chat with Karlton Spindle about the availability of the Multiplex vario, but he was wearing this apron that made me not want to stand that close to him, and I got so busy with the contest that I forgot to go back. I saw a stack of them on his table though, so I would guess they aren't too hard to get.

### Montague Cross Country Challenge

Since it is building season, I think it would be a good time to clarify a rule about the classes for next year at the Montague Cross Country Challenge. There will be an open class and a three function class. The three function class will mean rudder, elevator, and spoilers or flaps. The spoilers or flaps must function together and not independently - they cannot cause the sailplane to roll. If there is any subject I am missing or don't appear to know what I am talking about, please send me an e-mail and I will work it into the column.



### International Scale Soaring Association

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

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### Sandpaper, Sanding, and Safety

This last month, I completed the sanding on my Bowlus Baby Albatross' mahogany fuselage. Several folks dropped by during the sanding process, noting the Baby Albatross on the workbench. Walking over to take a peek, they all said the same thing. "How did you get it so smooth?"

Well, it took a lot of elbow grease and sanding!

Looking back, I thought some of you would like a bit more information regarding the types of sandpaper used, as well as the techniques I applied. First, let's review the different types of sandpaper and why they are manufactured the way they are.

#### Garnett

Garnett is used primarily for wood. Available in many variations of grit as well as being available in different paper weights and cloth backings, it is very popular in hand sanding applications.

#### Aluminum Oxide

Aluminum Oxide is used when hand or machine sanding of wood, metal, plastic, and other materials/synthetics such as fiberglass.

#### Silicon Carbide

Silicon Carbide is used in the finishing

of non-ferrous metals such as stainless steel, concrete, and ceramics.

#### Other Types

There are, of course, numerous other types of specialty sandpapers, including Emery, Aluminazirconia, and ceramic, etc. Most of these will not likely be available through a local hardware store, however.

#### Grit/Grade

Checking the print on the back side of many sandpapers, numbers range from 12 to 600, indicating the size of the abrasive grain. The number 12, being very coarse, while 150-220 represents a medium or fine coarse grain, and 400-600 represents a very fine grain.

#### Bond

Bond is, of course, the adhesive that holds the abrasive grain onto the paper backing. Glue from animal hides is the least expensive. Resin bond is the toughest, resisting both heat and moisture, and lasts much longer. Of course, it's more expensive, but I find it worth the additional cost.

#### Open Coat

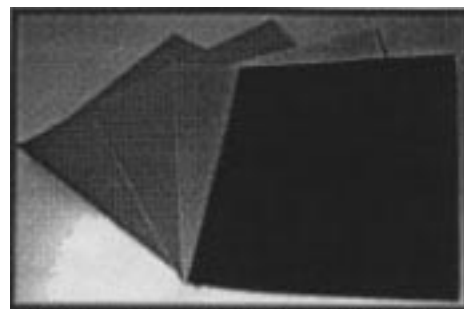
When the abrasive grain only covers 50-70% of the sandpaper, it's referred to as 'open grain'. This is only done for less clogging.

#### Closed Coat

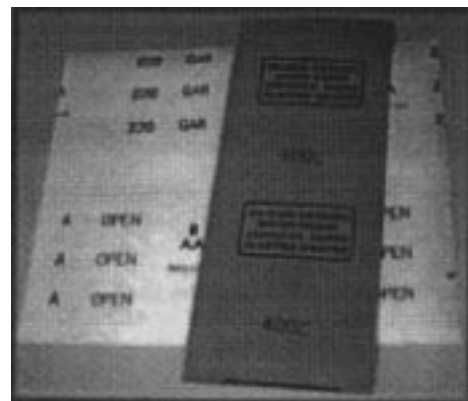
When the abrasive grain covers 100% of the sandpaper, it's referred to as 'closed coat'.

#### Protect Your Sandpaper

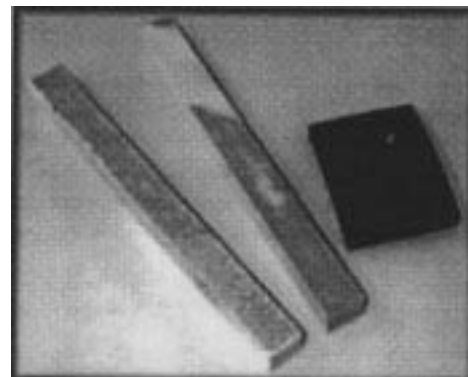
Sandpaper should be stored in a



Garnet sandpaper (L-R): 60, 100 & 220 grit  
Animal hide glue, open coat. 4th sheet: 400 grit,  
wet/dry, resin bond, closed coat.



Reading back of sandpaper: 220 grit, Garnet  
sandpaper, animal hide glue, with open coat.  
Other sheet: 400 grit, closed coat.

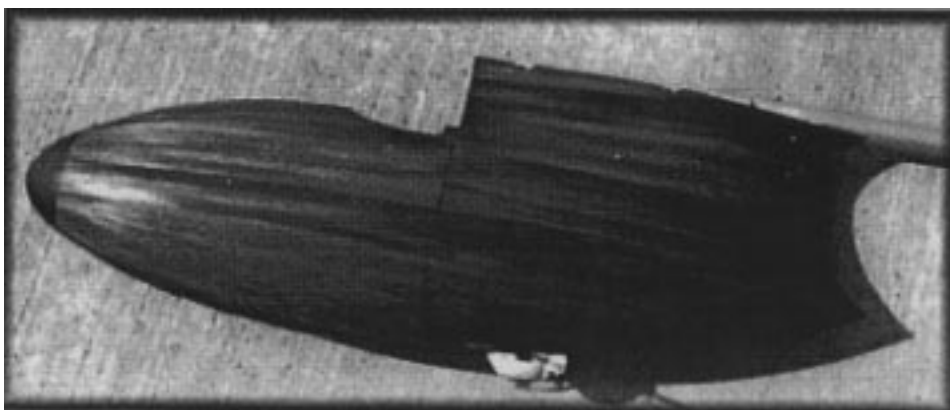


Home made sanding sticks and sanding pad.



Sanding respirator. Don't do any sanding  
without one. Remember, 'Safety First'.

(Left) Bowlus Baby Albatross final product  
after hours of serious sanding.



location where the temperature is around 60-80 degrees f., and the humidity range is 30-50%. Very low humidity from winter heating, or high humidity from rain or dampness can cause serious problems.

### Use of Sandpaper

Over the years, I have found the following to be true, when it comes to using sandpaper:

1) Always use a sequence of grits, starting with the most coarse grit, graduating to the finest, until there are no visible signs of improvement.

2) Always sand, with the grain, in straight, smooth strokes.

Having said all that, let's discuss just how I sanded the mahogany skin on the Baby Albatross.

### Sanding the Mahogany Skin

First, the strip planked fuselage and excess glue in all the joints made for a very rough surface, requiring some very serious sanding. Selecting a 60 grit, homemade sanding stick, I was able to maintain a good grip, which allowed me to apply heavy pressure, removing high spots and excess glue. Once done with those tough areas, I switched to a 100 grit sanding stick. Once the fuselage began to appear pretty smooth, a 220 grit sanding pad was applied. A vacuum cleaner/shop vac easily removed the sawdust.

Using a water-damp sponge, the fuselage was wiped down and left to dry overnight, because the moisture from the damp sponge will raise any small dents in the wood surface, also raising the grain in the wood.

The next day, after the fuselage had dried, I found that there were, indeed, still some imperfections. Using 220 grit sandpaper, a bit of light sanding left the wood surface ready to seal.

### One last Tip

One last important tip about sanding:

### Work safely!

For those of you that plan to sand, I would suggest the use of a respirator, which can be purchased at most local

home builder supply stores. They range in price from \$1.50 up and, of course, there are various types, depending on what one is working with. I'm using one that costs \$2.50, useful

when sanding wood or fiberglass. It's made by 3M, Model #8210.

Until next month! Go with the grain!

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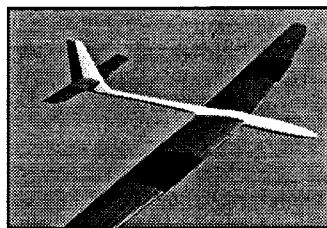
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52 1/4" fuse, nose cone	\$90.00	\$15.00
Contestant (148"/E205/3-4/10.5" chord)		
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44 3/8" fuse, nose cone	\$80.00	\$15.00
Oden (100-130"/S3021/As Req./10.25" chord)		
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Raven 3m (119"/Mod. E193/As Req./10.75" chord)		
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Stiletto S-3021 (100-136"/S-3021/As Req./9.5" Chord/plug-in wing)		
49" fuse	\$85.00	\$15.00
Stiletto S-7037 (100-136"/S-7037/As Req./9.5" Chord/plug-in wing)		
49" fuse	\$85.00	\$15.00
Stiletto HQ 2.5/9 (100-114"/HQ2.5/9/As Req./10" root cord/plug-in wing)		
49" fuse	\$85.00	\$15.00
Zen (100"/None/Var.)		
51" fuse, hatch	\$85.00	\$15.00

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# The RCSD Air Combat Maneuvering School

## Slope Foamie Combat Tips from A Master



Here are 17 lessons from the Dave Sanders Slope Combat School. I collected them over many flying sessions and discussions with Dave Sanders over the last few years at flying sites in California, Kansas, New York and Massachusetts. This article contains material previously published in *Model Airplane News* and *Quiet Flight International*, and is expanded for this *RC Soaring Digest* presentation with new material.

### Preparation

1. Light Is Right. Lighter planes are preferred for slope combat because they recover quicker after a collision.
2. Get rid of the warts. Get your covering smooth to reduce drag. Re-iron the covering with a hot iron. Apply patches over tears and stick down the loose film. Inspect the hinges, servos and linkages - if in doubt pull it out and fix it.
3. Practice incessantly. You cannot know your plane too well.
4. Practice flying in all types of air, especially in light air. Know your plane's stall characteristics. Try to get a

trim flight on the event hill on the day of the meet.

5. Learn to recover from odd positions. Many air combat engagements end up in knife fights where you're grimly slugging it out low and slow. This can quickly turn into the classic problem: "out of altitude, airspeed and ideas all at the same time." Practice recovering from this unhappy situation and you'll be able to keep flying many times when you would otherwise have been on the ground. Push the nose down, fly out and away from the fight, gather some airspeed, gain some altitude, then re-enter the fur ball.

6. Fly computer sims. If you want to learn a lot about air combat quickly, fly computer flight simulators, particularly those that model WWII aircraft: the gun fighters, planes built before air-to-air guided missiles were invented. The very fastest learning will come from flying online multi-player head-to-head air combat games like Kesmai's Air Warrior. (See *Model Airplane News*, August 1994.)

### Strategy

7. Inspect the battlefield. Look for

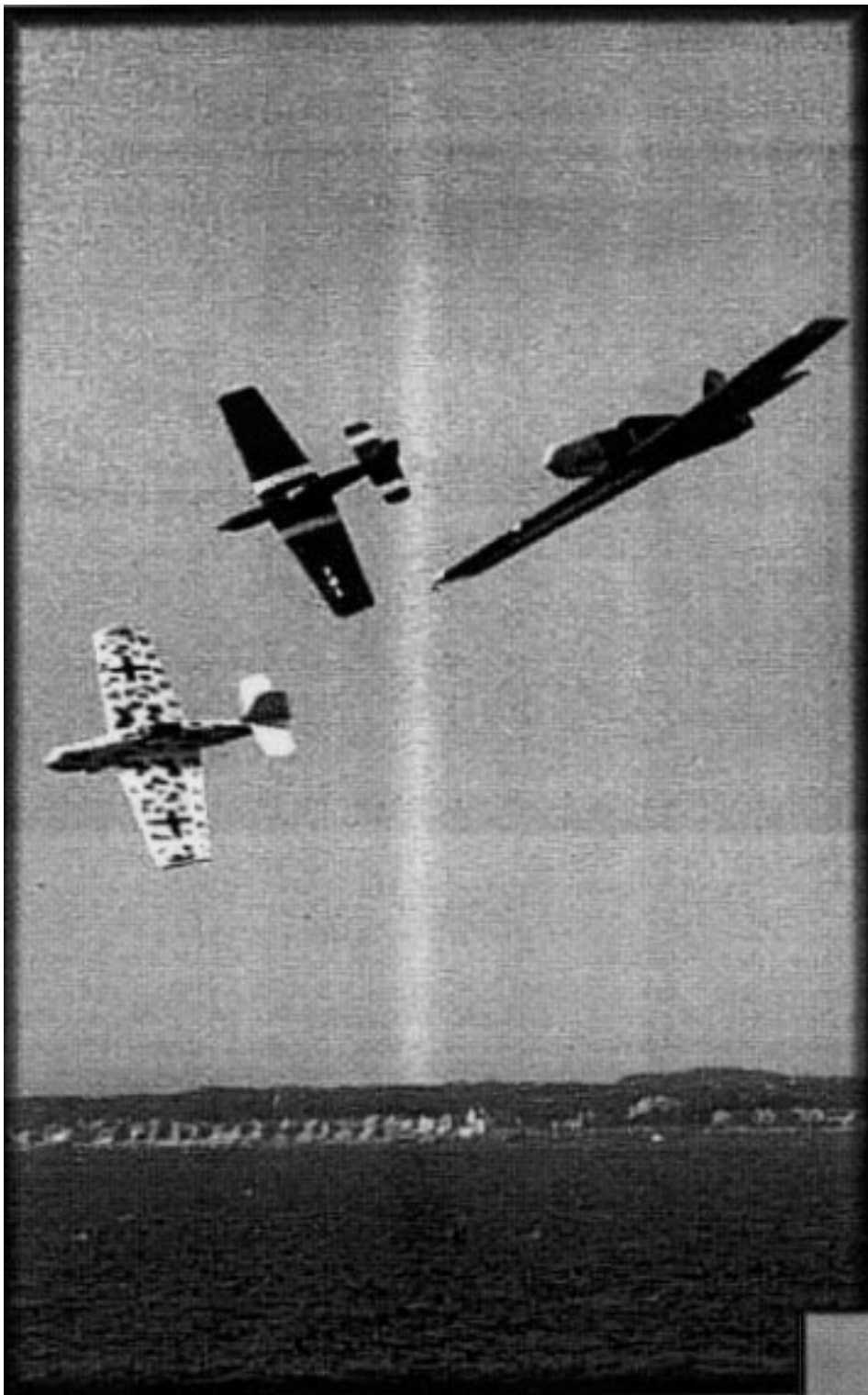
the high-lift compression zones. Know where not to fly. Know the easy recovery areas so your caller can get your plane back into the air sooner.

8. Watch the ball. Don't watch your own plane; focus on the opponent's plane, and watch your own with peripheral vision; this will help you set up an intercept. Just like in baseball, you don't look at your bat, you keep your eye on the ball.

9. Watch other flyers performing their trim flights. Look for guys flying in tight and close, for they're the competitors. They are the ones you will most likely engage and they will score on you. Look for lame ducks - the poorly trimmed planes flown by sloppy pilots, as they can be easy kills. Look for the guys who seem to fall out of the sky as soon as the lift is down.

10. Choose a caller who will run and fight for you, one who will dash down and relaunch for a quick recovery. Time is critical. You can't win by staying out of the fight.

11. Preserve your energy. The primary resource for air combat success is potential energy, either altitude or airspeed. In slope combat we need



enough kinetic energy to cause the opponent to "depart from controlled flight," as that's the way we make a kill, but more importantly, having potential energy gives you tactical options. You can dive on an opponent in a slashing attack, and then get away quickly. You can pull violent evasive maneuvers. You can exit a bad situation and live to fight another day.

12. Don't launch early, if this option is available to you under the rules of

the day. Avoid exposing your plane to damage before the time slot starts. On initial launch the objective is to gain altitude and observe the opposition.

### Tactics

13. Don't chase a target out of the kill zone. You've formed a mental picture of where the best lift is, and

where your caller can easily recover your plane. The counterpart defensive move is to pull your hot attacker out of the kill zone and up and away into the safety zone where you can easily recover from a collision. Conversely, try to get the *Lame Duck* when her's suffering down low.

14. Appear to be crippled to invite attack. Park your plane in the compression zone at low ground speed. Half the battle is won when he dives on you; all you have to do is screw him up a little, a small touch, and he drives into the ground.

15. Keep flying the airplane. Sometimes you lose sight of your plane. You may be distracted by other aircraft, or you may have flown below the hill, and now your heart stops because you don't see your plane. Keep flying. Fly as if you still know where your plane is and what it's doing, and you'll be surprised at how many times it'll pop out into sight flying crisp and clean.

16. Never stop flying your plane until you know you're down for sure. Too many guys give up when they could have recovered and kept flying.

17. The Brick Wall Defense. When a guy's on your tail and ordinary maneuvers have failed to shake him, pull a quick and hard turn to present the top side of your plane to his nose. The idea is for him to hit you square in your plane's CG. This brings him to a dead stop, while you continue forward with nearly all your energy. This technique is also excellent if you can overtake a slower plane.





# TECH TOPICS

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## GET THE LEAD IN!

At the last TulSoar club contest, two of us were flying EPP foamies and having a fun time. Contest standings just didn't matter this late in the year. Getting out to fly on a Fall day was plenty good enough.

The planes we were flying are fine little ships. But they're pretty light wing loading and sport a high lift airfoil - great floater and very forgiving. But the wind was blowing around 10 mph on the surface and about all we could do was launch and hover since the winds aloft were blowing noticeably stronger.

This got a couple of us going on the use of ballast to improve penetration capabilities on windy days. Some of the more experienced pilots noted that ballast did more than just improve penetration. Adding weight to a lightly loaded ship generally improved the handling characteristics and lift to drag ratio, as well.

One of us (guess who) started blather-ing on about polars and how that came out of the calculations for wing loading, etc., etc. After a little thought, that seemed like a topic that we hadn't reviewed in a while in this space. So here goes!

Actually, there appears to be an interesting trend re-appearing in sailplane design for which this topic is relevant. Now that a number of molded wing ships are available for purchase, the newer ones appear to be tending towards lighter wing loading with modest lift coefficient airfoils (RG-15, MH-32 for example).

Blaine Beron-Rowden went down this road quite successfully a number of years ago with the Mirage. This design took a very interesting approach to the performance envelope problem. The aspect ratio was moderate, the wing loading was quite low and a low camber airfoil was employed. The idea was to have excellent minimum sink (low wing loading) while still having good speed range and L/D (low

camber airfoil, good aspect ratio).

Recently this trend appears to be under investigation again with some of the new molded ships from Europe (the 'Organic' appears to be an example). Is this really a fruitful way to go? Certainly with a high lift airfoil and a low wing loading you'll have trouble on a windy day. But what about a high performance ship? Does wing loading really hurt you that much? We'll tackle that in a future column. But for now, let's look at our floater.

To evaluate wing loading effects, we first have to do an analysis of a sailplane's performance envelope. The output from that analysis can be visualized as a plot of forward velocity vs sink rate over the allowed range of operation of the sailplane. This is the infamous 'polar plot'. Its interpretation can sometimes be confusing. For an excellent review of how to interpret polars without a lot of calculations, Bill and Bunny Kuhlman's book "Understanding Polars Without Math" is a

great place to learn more.

For now, we need to make a few assumptions before we can calculate how weight (wing loading) can affect performance:

- 1) The sailplane is flying under constant conditions. Lift and drag forces are exactly balanced by the effects of gravity. That is, the ship is neither accelerating nor decelerating,
- 2) We have an accurate representation of the airfoil's capabilities over the range of speeds accessible for the condition described above. For a number of airfoils, this data is now available from the work of Dr. Michael Selig and his students at the University of Illinois, Urbana-Champaign,
- 3) The induced drag over the speed range of interest can be reasonably represented by equations provided in standard aeronautical texts: i.e., lift coefficient (squared) divided by ( $\pi$  times Aspect ratio),
- 4) Assumptions need to be made about total parasitic drag from the

**Figure 1: 2 Meter Sailplane Polar  
32 Oz. Flying Weight**

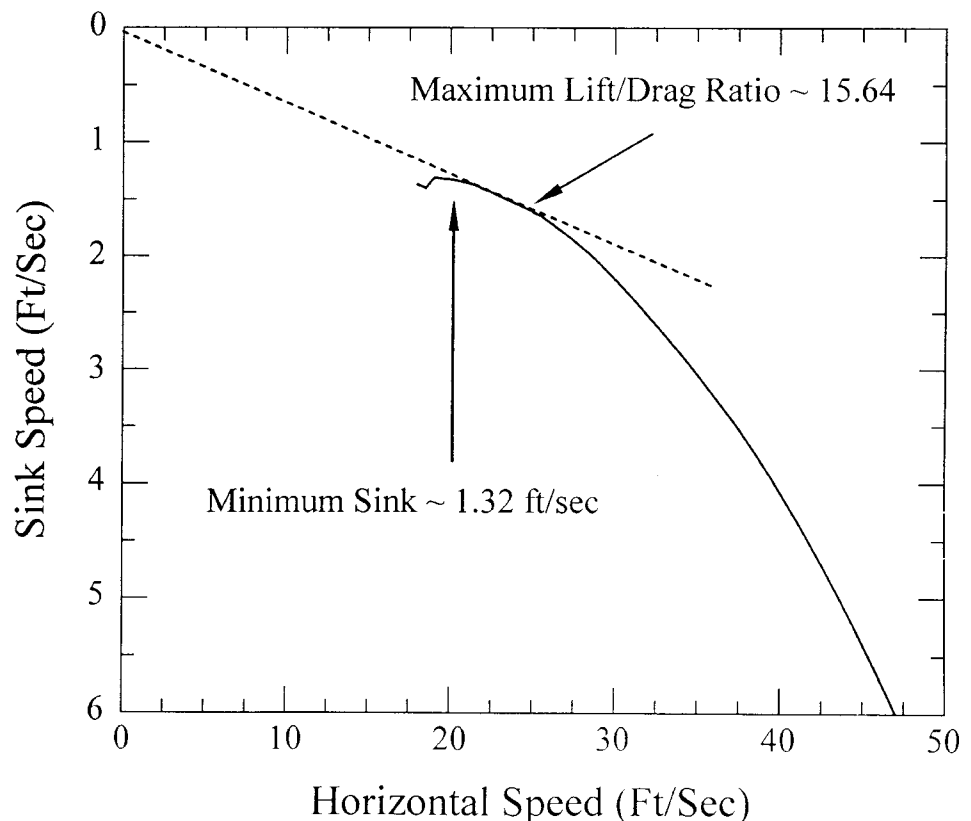
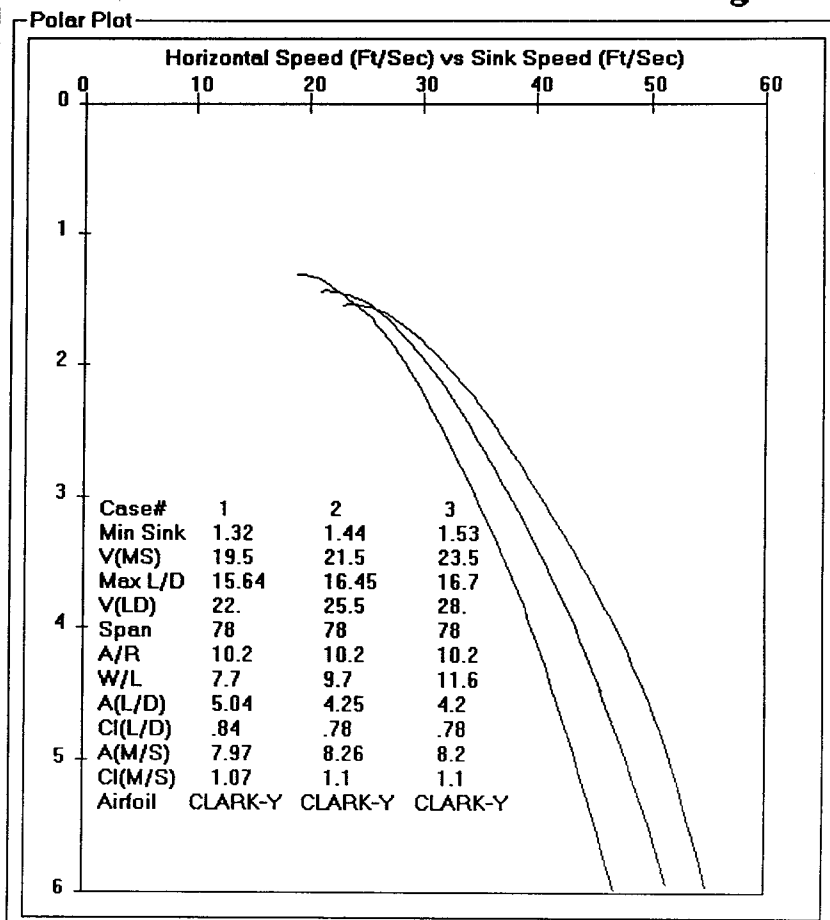


Figure 2

Selected Airfoil <b>CLARK-Y</b>	Planform Name <b>HighLander (2m)</b>
WingSpan (inches) <b>78.</b>	Weight (ounces) <b>32</b>
Aspect Ratio <b>10.22</b>	Wing Load (oz/sqft) <b>11.61</b>
Avg Chord (in) <b>7.632</b>	Fuse Drag (L/M/H) <b>H</b>
Wing Area (sq) <b>595.3</b>	Tail Section <b>Flat Plate</b>

RVC (0.037-0.053) <b>0.0582</b>	Vertical Area <b>51.970</b>
TVC (0.38 - 0.49) <b>0.486</b>	Horiz. Area <b>84.927</b>
TPA (28 - 36) <b>33.69</b>	Tail Moment <b>26.000</b>
V-Angle (Deg) <b>103.930</b>	V Area <b>68.449</b>



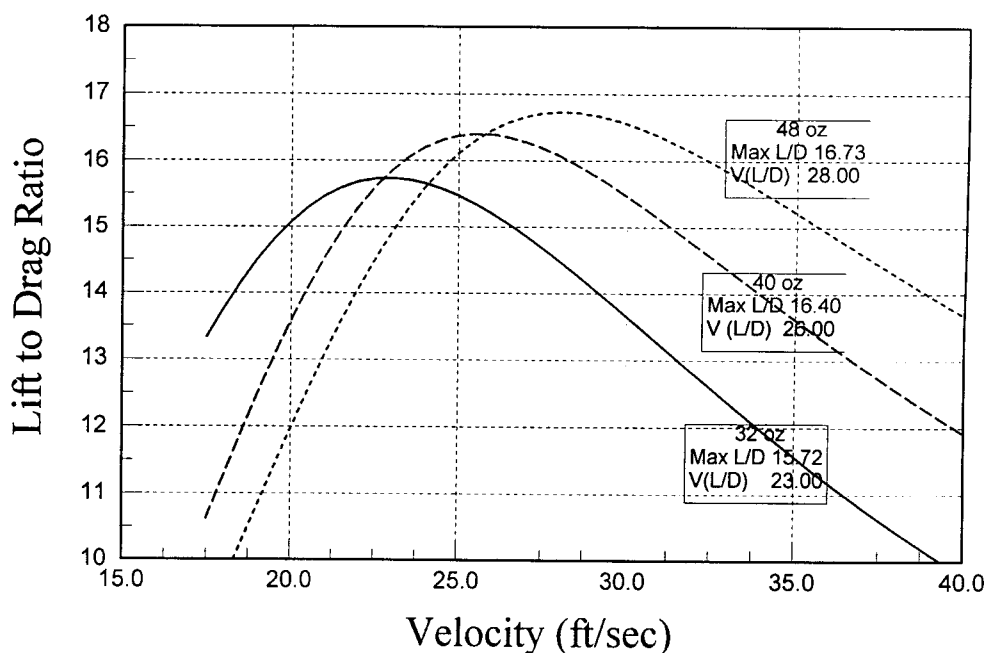
fuselage and tailplane. For this example we'll assume the horizontal and vertical tail surfaces are flat plates near zero degree angle of attack. For the fuselage, we'll take the total surface and treat it as an equivalent flat plate, also.

In the not too distant future we'll explain these assumptions in a little more detail. For now, we're making a comparative calculation on the same planform while just changing the overall weight. So if you don't agree with me on the absolute numerical results, the trends with weight should still provide useful guidelines.

Let's look at the specific example of our floater in a typical Oklahoma breeze. (Go Sooners!) From the ship we're flying, I've got the following details:

Wing Area: 595 sq. in.  
 Aspect Ratio: 10.2  
 Airfoil: Clark-Y  
 (roughly)  
 Weight: 32 oz.  
 Tailplane Area: 137 sq. in.  
 Fuselage Surface Area: 145 sq. in.

Figure 3: Maximum L/D vs Speed





With this input, we can perform our calculations for the performance envelope of the ship and come up with the information shown in Figure 1. What we're looking at here is a plot of the forward speed of the ship (horizontal axis) against its sink speed (vertical axis). Two points are of particular value from this plot, the minimum sink and the maximum lift to drag ratio (L/D).

Minimum sink is just that - the point where the vertical, or sink, speed is lowest. Going slower creates a lot of induced drag and ultimately triggers a stall. Going faster reduces induced drag but also decreases the lift coefficient and increases the overall sink rate.

Maximum L/D is the most efficient cruising speed for your sailplane. It's just a few clicks faster than the forward velocity for minimum sink and can be found by drawing a line from the origin of the graph (zero point) to a point that just touches the polar line on the plot. At this speed, you'll cover more ground cruising around the field than at any other trim setting (assuming you don't hit lift or sink on the way around).

For the example given above, the min sink is estimated to be ~ 1.32 ft/sec. at a cruising speed of 19.5 ft/sec. while the max L/D is approximately 15.64 at a cruising speed of 22 ft/sec.

What happens to these numbers as wing loading is increased? Let's first toss in 8 oz. and then 16 oz. of lead and see where it goes. A normal assumption is that the whole curve just moves down and out some, but that's not quite correct. Due to a complex interplay of the aerodynamic terms, it turns out that the curves do move down and to the right a bit but they also tend to become broader. This can be seen in figure 2, which takes the planform we've chosen and looks at the three proposed weights (32, 40 and 48 oz.).

Figure 2 is a screen dump of my polar program and is used here because it provides a convenient summary of some of the numbers. It also helps illustrate some of the advantages of using ballast.

We first observe that by adding 16 oz. of lead we increased the wing loading by 51%. However, the loss of mini-

mum sink is only about 15%. At the same time the maximum L/D actually increased by 7%. So obviously the response is not linear in loading and can provide an efficiency improvement (as seen in max L/D) under certain circumstances.

Let's look at that max L/D number a little bit harder. Keep in mind that what we're trying to do is cover a little ground to find some lift on a breezy day. At the lightest wing loading, max L/D is about 15.6 at a velocity of ~ 22 ft/sec. Suppose you're flying in a 10 mph breeze (not at all unusual in Oklahoma - Go Sooners!). Converting that wind speed we find that a 10 mph breeze is about 16 ft/sec. Therefore, at the lightest wing loading, your speed over the ground at max L/D (into the wind, at least) will be about 6 ft/sec. At the higher wing loading, your forward speed over the ground will increase to around 12 ft/sec.

Right off that bat we've got a significant advantage. We've lost about 15% in minimum sink, gained about 7% in efficiency (max L/D), but we've DOUBLED our speed over the ground in this breeze. Although going from 6 ft/sec. to 12 ft/sec. may not seem like much, let's do an example calculation and show what it can buy you.

Suppose you've launched to about 400 ft. and the other guys have found a small wave about 1200 ft. upwind kicking off from a small burm. The wave appears stationary at about 200 ft. altitude. Can you get there from that launch height?

You've got 200 ft. of altitude to use up. At 32 oz weight and max L/D, you'll burn up that 200 ft. drop in about 140 sec. During that time, you can penetrate forward about 850 ft. Nice try, but the other guys ride the wave while you do the walk of shame to retrieve your ship!

At 48 oz. weight, you'll drop 200 ft. in about 120 sec. During that time you can penetrate over 1400 ft. Go ride the wave and have some fun.

Let's look at the 40 oz. case as well. At max L/D you'll drop 200 ft. from launch in about 130 sec. During that time you can penetrate at least 1200 ft. so you might just barely make it.

The point is, lead can be your friend under these circumstances, so don't be too timid about dragging it out when the wind comes up.

What's really happened here is the extra weight has slightly increased your sink speed, slightly increased your efficiency while at the same time significantly increasing your velocity over the ground. The loss in sink speed is more than made up by your ability to cover more ground to find lift. At the highest wing loading it increased your usable range over the ground by over 60%!

Now all of this is predicated on running your plane at the optimal design point for a given wing loading. Sometimes you don't want to do that. So let's look at a case where you absolutely, positively, have to be there faster than that.

Let's go off max L/D a bit and say we really want to cover ground at about 20 ft/sec. Given our little 16 ft/sec. Oklahoma headwind (Go Sooners!), that means our true airspeed will have to be about 36 ft./sec.

In figure 3 we're looking at the same data contained in Figure 2, but plotted a little differently. Instead of a simple polar plot, we'll graph L/D ratio against forward speed. That way we're looking directly at flying efficiency. We can still get the sink speed for any horizontal speed by simply dividing by the L/D at that velocity and wing loading.

We've again compared the 32, 40 and 48 oz. cases but now expanded near the 40 ft/sec. horizontal speed range. Note that the velocity for max L/D at the lowest wing loading is the most efficient point for any of the curves at that speed (~ 19.5 ft/sec.). However, as soon as you go a little faster than that up a bit, the low wing loading curve is the worst one at any speed. Let's do another numerical example to illustrate the point.

From the figure we note that the sink rates for each wing loading at our targeted speed of ~ 36 ft/sec. are approximately:

32 oz:	sink rate ~ 3.25 ft/sec
40 oz:	sink rate ~ 2.70 ft/sec
48 oz:	sink rate ~ 2.42 ft/sec

So at these higher speeds your sink rate will actually be LOWER for the higher weight and wing loading. That's the consequence of moving to a better L/D at the higher weight under these conditions. For the low wing loading case you have to fly at a lower lift coefficient to get to this speed. At the lower Cl, most of the drag is now parasitic. Therefore the Cd is bottomed out but the Cl is dropping so the L/D goes down.

An even simpler way to think about it is that the lower Cl requires a lower angle of attack. That means you're pointing the plane more towards the ground and that ain't good.

With these numbers in hand, let's again launch to 400 ft. At 32 oz. weight, you can cover a bit over 2400 ft. into the wind before you're on the ground. At 40 oz. weight you can cover almost 3000 ft. and at 48 oz. you'll go around 3300 ft. before landing. So the higher wing loading gained you over 30% more territory to

cover before you ran out of altitude, even at a non-optimized L/D point on the curve.

Let's take a look at our previous example. Suppose you were trying to chase out to that wave lift over the burm again. Using the high speed dive at the lower wing loading, you MIGHT just make the wave (~ 1200 ft.), but you've got nothing left over for insurance. At 40 oz. you can make it comfortably (1500 ft.) and at 48 oz. it's a piece of cake (1650 ft.).

Bottom line - under ANY speed conditions, when the wind comes up, the advantage for covering ground efficiently clearly goes to the lead sled. The numbers given here simply try to illustrate that point. Best way to prove it to yourself is to set up about an 8 to 12 oz. ballast bar (mounted at the CG so things don't get out of hand!) and go to the field on a windy day. Try a few flights with and without the ballast. Even if you don't believe the numbers discussed in today's column,

I'll guarantee you'll see the difference in the air and that's where it really counts.

So long from Oklahoma for this month! (Go Sooners!!!!)

## References

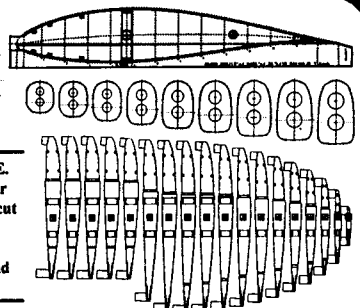
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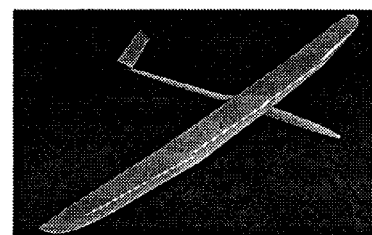
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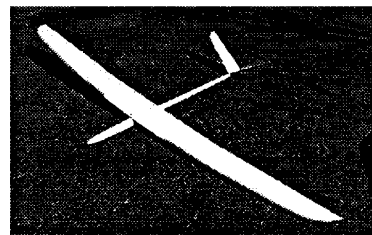
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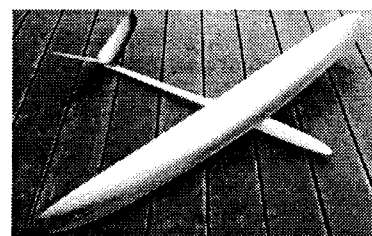
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# HAVE SAILPLANE, WILL TRAVEL!



*Charles French of the Capitol Area Soaring Society readies his hybrid pieces-parts sailplane, with Barry Drew assisting on retriever.*

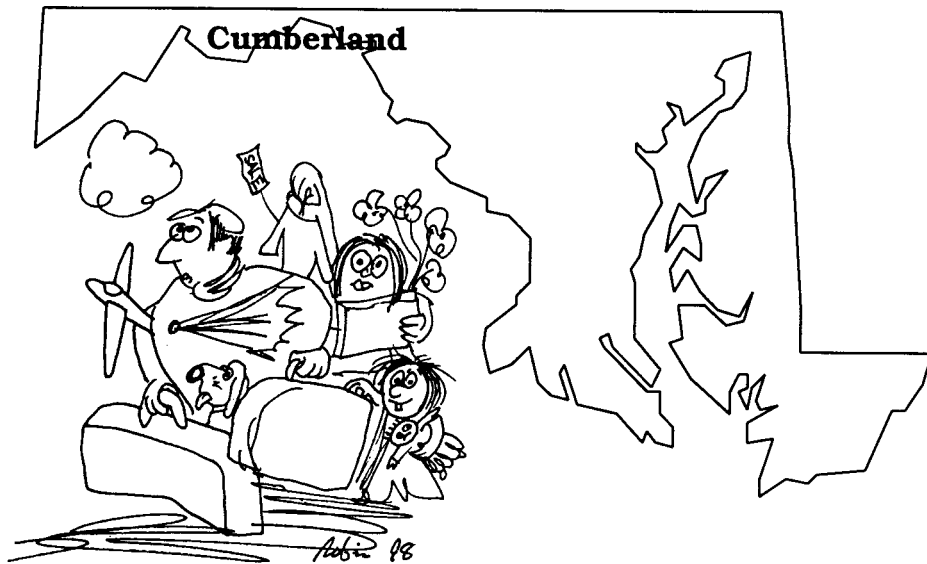


*Bill Bob Cotrill and John Eschbach comparing teeth.*



*Jonathan Horchler, from Tyler TX, retrieves his Dad's Spirit 100.*

**R/C Soaring Digest**



By Tom H. Nagel  
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## SLOPE SOARING WITH THE GHOST OF WERNER VON BRAUN

It was the end of October. Bats were fluttering overhead at the end of soccer practice when I told the kid's coach "I'm driving out to Cumberland, Maryland this weekend for a slope

flying meet." He eyed the circling bats. "Sounds like fun," he said.

Fun indeed. I was headed into a weekend filled with wild winds, shattered airframes, rugged Appalachian ridges and the ghost of Werner Von Braun. I was headed for the 34th or so Annual Cumberland Soar for Fun.

One of the best kept secrets of the Cold War era was that NASA





(Above) Jay Stargel launches his WACO Millennium; Barry Drew on retriever.



(L) Host Jim Dolly (R) and Bob Massman, Wilmington, Ohio, in front of the mountain top "Adirondack".



rocket scientist, Werner Von Braun, flew sailplanes for recreation, taking off from the glider port at Cumberland, Maryland, near the Allegany Ballistics Lab where he worked. The valley there was known for producing not only reliable ridge lift but also, when conditions were right, monstrous wave lift.

From down in the Potomac River  
October 2000

valley, Von Braun and his flying buddies could see a big meadow high above the lab on the crest of Mount Knobly. Somewhere Von Braun had run into modeler Maynard Hill, who wanted to try to set an RC altitude record. The meadow on Mt. Knobly looked like the right place to take off and land for the attempt. Von Braun and Hill set out to locate the owner and gain permission.

Mount Knobly from the Potomac River valley. The Cumberland flying site is the narrow strip at top right, about 900 feet above.

(Insert) The Allegany Ballistics Lab, from Mt. Knobly. Werner Von Braun, looking up from his lab, helped spot Mt. Knobly as a flying site.

The altitude attempt in 1967 failed, but a tradition of annual fall, non-competitive soaring from the top of Mt. Knobly was born. Some of the same flyers





from those early days are still attending. Flyers drive in for the weekend from all over the east coast and midwest. Local club member, Dr. Jim Dolly, bought 46 acres on top of the mountain, including the meadow and some surrounding area. And volunteers built a roomy "Adirondack" shelter a few years ago, complete with a wood stove. Best of all, Jim Dolly has put in a well-graded gravel lane running the 1.3 miles from paved road back to the flying site. The number of crumpled planes has remained constant, but the number of smashed oil pans and destroyed transmissions has dropped dramatically.

Skip Schow has been organizing the event in recent years. He announced the event on the soaring exchange ([soaring@airage.com](mailto:soaring@airage.com)) and sent me very complete maps and directions via e-mail, plus phone numbers for local motels. Flying buddy and travel consultant Don Harris told me what to take along. "Take along everything," he said. "You can never tell about that place."

I'd only been to Cumberland once before, to retrieve my elderly parents when dad had a little heart fibrillation while on vacation there during "Leaf Season." I flew in on a commuter prop jet that scared the Sheetz out of me as the plane descended into an apparently bottomless valley and mountains rose around us. (Sheetz is a quaintly named string of local convenience stores where you can buy all sorts of ...um... stuff.) I drove from

Cumberland to Frostburg and back looking for a room. All the motel rooms were taken up with 'fall color' tourists, and I wound up sleeping in the folks' car, out in the hospital parking lot. I figured, no matter what, this second trip to Cumberland had to be better.

It was startling to get off the freeway and recognize the place from the hallucinatory rescue trip. Breakfast at Denny's gave me another flashback — and promised more flashbacks as the day progressed. (That's what I get for eating at Denny's.)

The Cumberland flying site is actually in West Virginia. The trip from West Virginia Rt 28 up to the top of Mt. Knobly on Jim Dolly's mule trail was quite an adventure. I kept imagining that I heard banjos playing "Deliverance" in the background. I pulled out onto the meadow around 10:30, and festivities were already being perpetrated all over the mountain top. Most involved flying.

The slope lift at Mt. Knobly is quite a way out over the valley, and launches must clear a low tree line and a big field full of nasty thorn apple scrub. Skip and Jim had a winch and retriever set up into the prevailing wind, and a couple of stout high-starts and bungees were pegged down around the spacious meadow. Jim had a frequency board hung on the cabin wall, so I swapped my AMA card for an open frequency and began to think about flying. But first I had to meet a

*The flightline at Cumberland.*



*Gordon Cotrill launches his Patton Aircraft Spitfire.*



*Steve Pasierb and a variety of toys. Everything flies at Cumberland.*

few people.

Billy Bob was consulting with his orthodontist about some broken teeth. Turned out his servo had worse teeth than he did. I grabbed a photo. They steered me toward our hosts Skip Schow and Jim Dolly. Then, I needed a launch assistant or two. I wanted to fly my RPVI U-2, which has a fuselage like a loaf of French bread. Jonathan Horchler, age 10, in from Tyler, Texas to visit the cabin he'd helped to build, helped his dad Jim fly a big 100" Spirit, and shag sailplanes. He was eager and

capable in helping me get the U-2 airborne. His buddy Jacob Marker helped out, too. There is a picture of Jonathan with his dad's plane.

The winds at Cumberland are fickle, and on Saturday they refused to come around to the preferred West-Northwest heading until late in the afternoon. Low level turbulence was plentiful, and big lift was often accompanied by big sink. Steve Pasierb gave a demonstration on how to trash two sailplanes in one flight, as he crashed on launch, right into one of his own parked planes. Other entertainment included a variety of off-field landings and repeated over flights by full sized, two seater Blanik sailplanes.

Planes of all sizes and descriptions were being flown, from one end of the price and style scale to the other. Many pilots were flying both slope and electric. Planes I remember seeing include an Ellipse, a mini ASW-27, Pico Jet, a Mongo and Mongo Jr., a Gentle Lady, a Mantis or two, a Thunder Tiger ARF, a mini Ellipse, an FMA Razor, a foamie scale Spitfire, a Mach None converted for slope, and a Bird Works Zipper. (I'm sorry guys, but most of those big glass slippers look alike to me. There were a bunch of them there, but I couldn't tell them apart.) Bob Massman put up a Sagitta XC for an 8 hour attempt, but the winds did not cooperate. The Zipper did some of the fastest and most aerobatic flying of the whole weekend.

The U-2 just wasn't hacking it. Not enough strong lift close in. I tried the Mongo Jr., and had better success, but still no long, high flights. The crowd looked like it needed a laugh. I broke out the infamous Flamingoid. It was, after all, a fun fly. No one was more surprised than I that the Flamingoid seemed to be designed for flying off Mount Knobly. I wanted to get enough altitude to throw a scare into the full sized Blanik pilots, but that was not to be. Every time I got some good altitude, the Flamingoid would make a dive down into the valley, looking for the local Red Lobster. (The Flamingoid flies in the RES class — rudder, elevator and shrimp.)

By 5:30 in the afternoon, my feet were killing me from standing on the steeply sloping meadow all day. I headed back to the Super 8 for a long

shower, Advil and dinner at the Braddock Motor Inn with some fine gentlemen from the Lancaster area soaring group.

On Saturday it had been decided that, as an attorney, it was my job to safeguard the honey baked ham overnight. Thus, bright and early on Sunday, I was headed back to the slope, despite 30 degree temperatures, wind chill, deer all over the highway and common sense. And we did it all over again. Electrics screamed, two Mongos mated, Bob Massman waited, and the honey baked ham got nibbled down to two lonely soup bones.

I can hardly wait for next year.

#### **IF YOU GO:**

Take to fly: everything and anything, from mini electric to giant scale, from high tech to built up balsa. But my impression was that Cumberland is a big slope with a lot of far-distant flying. A big cross country plane with good landing habits would be just about perfect.

#### **Drive:**

Something with a lot of ground clearance.

#### **Avoid:**

Denny's and the thorn trees at the bottom of the slope.

#### **Expect to use:**

Your high start and your repair kit.

La Vale, Maryland is located on the National Road, old US Rt 40, right off Interstate 68 in western Maryland, down in the Potomac River valley. It is about 200 miles from Baltimore, 290 miles from Columbus, Ohio, and about two gazillion miles from Torrey Pines. You can find maps at topozone.com by searching for Short Gap in Mineral County, West Virginia, and then scanning a little north for Mount Knobly. Look for the mountain top clearings just across the Potomac from Cresaptown. The access roads do not show on the topos. Access is restricted and by invitation during the rest of the year.

Local attractions for those non-flying members of the family include truly spectacular fall color, the Western Maryland Scenic Railroad, the WISP

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](mailto:tomnagel@iwaynet.net) for gentle editing and suggestions.

Tom

ski center at Deep Creek Lake, trout fishing in Western Maryland, white water rafting, Old Latrobe brewery and Frank Lloyd Wright's Falling Waters in nearby Pennsylvania.

Thanks to Skip Schow and Jim Dolly for background information and photo caption help for this article; and to Gordon Cotrill for false teeth. Thanks to the locals for the weird spellings for Knobly and Allegany.



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## ADDENDUM TO SHIP IT!

By Steve Savoie

There is another shipping option you may want to consider: the airlines. Since most fliers who need to ship planes are most likely flying to the soaring site, why not utilize the airline, as well?

They all vary, but I'll use American Airlines as an example. American allows either 3 checked bags, 2 checked and 1 carry on, or 1 checked and 2 carry on. Most planes will not allow carry on, so let's go directly to checked. American requires that checked baggage weigh no more than 70# per article and that "the sum of the length plus width and height shall be less than 62" when two bags are checked, or no greater than 45"

when only 1 bag is checked.

Don't confuse this measurement method with that of UPS; they are different. UPS uses girth (2W+2H) + length; American uses L+W+H.

In general, you'll find that the airlines will likely inflict less damage on articles than shippers (personal experience and opinion). Dave Sanders told me that he ships his combat foams without boxes; he shows the ticket agent that its a foam rubber airplane and they just tag it and put it on the luggage belt. Remember, if you have an exceedingly long or unusual box, label it sporting equipment and it gets special exception - so I've been told...

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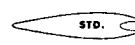
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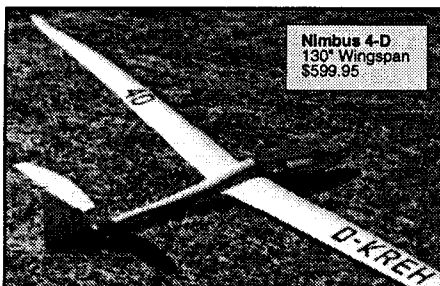
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## SCHEDULE OF SPECIAL EVENTS

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Dave Wenzlick, (480) 345-9232  
www.public.asu.edu/~vansanfo/casl

**February 9-11, 2001**

Pensacola 2001 Pensacola, FL  
Asher Carmichael, (334) 626-9141  
Carmic985@aol.com  
Rusty Rood, (850) 432-3743

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## 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 \$25.00 (Foreign) per year for 12 issues.

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



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.

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P.O. Box 3028

Muncie, IN 47302-1028 U.S.A.

## 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 disseminate information relating to construction techniques, materials, theory and related topics. To give recognition for noteworthy designs and accomplishments.

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

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



## The Vintage Sailplane Association

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

**Vintage Sailplane Association**  
1709 Baron Court  
Daytona, FL 32124 USA



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

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

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

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

ESL Web Site: <http://www.eclipse.net/~mikel/esl/esl.htm>

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



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**Photography by Dave Garwood, Scotia, New York.  
(This month, Dave Garwood shares foamie combat tips.)**