R/C Radio controlled SOARING DIGEST
THE JOURNAL FOR R/C SOARING ENTHUSIASTS

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Bookshelf Listings - A listing of recently published books of interest to aeromodelers.
Complete RCSD Index, 1984-1999

The Soaring Site

Arizona Slopefest 2001

For those who love slope flying, the following message just arrived.

"Just in case you can't wait till next year's Midwest Slope Challenge, here's a fix for you! The Central Arizona Soaring League (CASL) is sponsoring the first ever Arizona Slopefest, September 29-30. Garland Hanson is the man in charge.

"Although it remains to be seen if the biscuits and gravy are up to Kansas standards, the format is nearly identical to MWSC, rules and all.

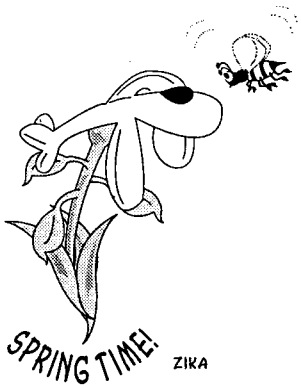
"You can check out the details at a very nice web site: <http://www.swlink.net/~ghanson/Site%20Banner.htm>."

(signed) Loren Blinde
mwsc@alltel.net

Happy Flying!
Judy Slates

Thank You

For those of you that called regarding our "family emergency", thank you! We appreciate the kind words in our hour of sadness. Mary Slates, Jerry's mother, passed away late June.



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

"JAY DUB"

Scott Hewitt examines his "Jay Dub," a huge leap forward in the evolution of foamie aircraft. This month, Scott discusses the JW and its amazing capabilities when it tackles the rigors of dynamic soaring.

Photography courtesy of Cliff Lindgren.

Jer's Workbench

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Tow Hook Location

Location, location, location... Any business person will tell you that to get the best performance out of any business is 'location', 'location', 'location'! Well, the same thing is true for the location of your tow hook. Its proper location will provide the best optimum launch one could wish for.

So, just where is the best location to install the tow hook?

There is no rule of thumb, nor secret formula, or anything carved in stone. However, the tow hook should be installed somewhere just in front of the C.G. (center of gravity).

So, where am I going with this?

The other day, while at the flying field, I overheard a newbie asking, "Where is the best location for my tow hook?" The answer was, "Just in front of the C.G." There was no explanation. As I recall, this was the same thing I was told some 40 years ago.

Well, this got me to thinking. I pulled some books from my library, searching for any information on the subject of tow hook location. It took several hours, but I located 2 articles. Both said pretty much the same thing. While they didn't provide the best location for the tow hook, they did provide a safe range, as shown in figure 1.

O.K., let's assume we don't know where to install our tow hook, so let's start by installing the tow hook at 30 degrees, in front of the C.G. On launch, while watching the model go up, do you see only the trailing edge of the wing or can you see the top of the wing?

If only the trailing edge of the wing can be seen, the tow hook needs to be moved aft a bit. If the top of the *wing* is visible, this is good. But, if you feel that you can get a bit more out of the launch, then move the tow hook aft just a bit more. For the optimum launch, the tow hook will be at its most aft position. There is, of course, a 'point of no return'. If you cross this point, you could lose some directional stability.

These test launches are intended to be done without the use of flaps and elevator. In order to attain the optimum launch, however, there is one more step to do. Let's call it the renowned modeler's 'Feel'. Meaning, "What do you feel that you can get away with?" So, let's add the use of flaps for a camber change and elevator to get an optimum launch. The 'feel' equates to exactly how much flap and elevator can be used before the model pops off the tow line, or the tow line breaks.

Once we identify the location, and feel comfortable with that location, the optimum launch will likely have been achieved. Oh, so high!

Resources:

"Radio Control Thermal Soaring"
by George Stringwell
RM Books, LTD.
Guildford, Surrey, England

"Radio Control Soaring"
by Dave Hughes
Radio Control Publishing Company, LTD.
High Street, Sunningdale
Ascot, Berks SL5 0NC, England

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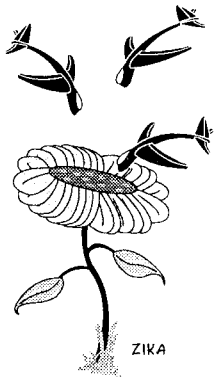


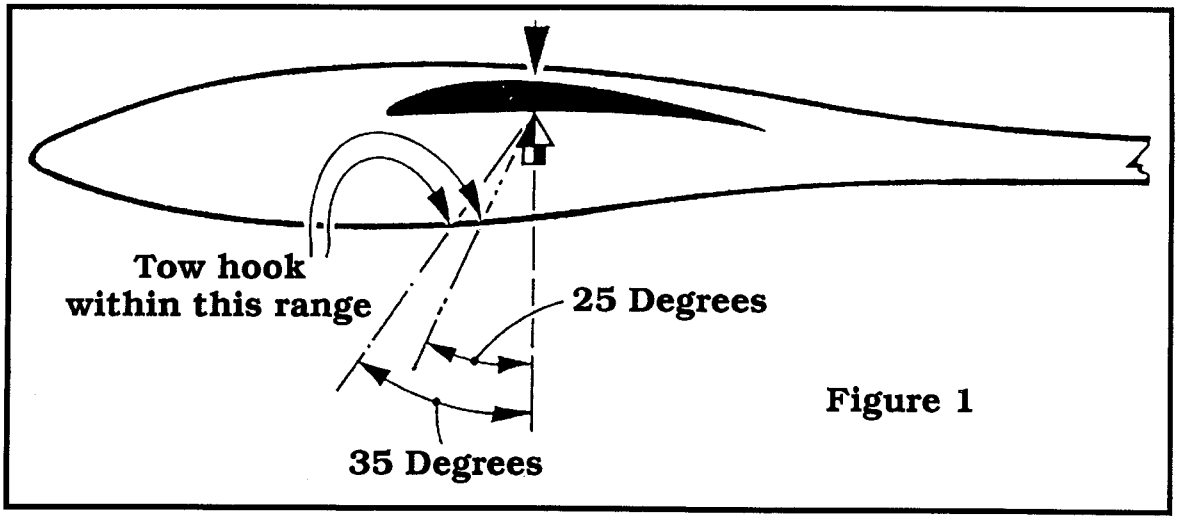


Figure 1

About Dynamic Soaring...

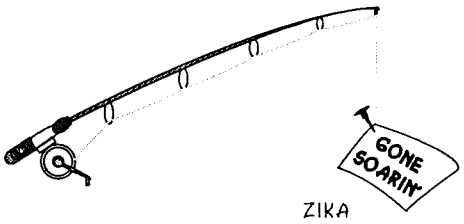
By Gordy Stahl
Louisville, Kewntucky

For those of you who don't know what 'DS' is, I thought I'd share my definition.

Slope soaring is using the energy of air which is compressing against the side of a vertical face (hills, dam-faces, mountain sides, etc.) as the 'power' to keep a sailplane flying. Normally, all flying would be done in front of that slope face where the energy is rising vertically. However, Dynamic Soaring is flying on the back side of that slope where there seems to be no energy (wind or air compression). Tremendous speeds have been recorded with radar guns of RC sailplanes flying in Dynamic lift on the backside of a slope. (The video 'Lift Ticket' shows a plane achieving over 172 mph.) How does it work?

Well, think of that wall of wind/ compressed air as a wall made of Super Ball material at the front edge of the slope. The pilot dives over the slope and immediately circles back toward the front. When the plane nears that wall, he pulls elevator to circle back toward the rear, his plane sort of 'bounces' or gets pushed from all that energy collected at the front of the slope.

Unending revolutions can be maintained once the pilot finds the right 'groove' or circular path to take best advantage of the phenomena. I think most RC slope pilots in the world will agree that Dsing is one of the most fun and exciting forms of RC sailplane flying they have ever experienced. While the phenom has been recognized for many years (lots of birds do it), us RC sailplaners owe its 'discovery' to Joe Wurts, who hit that wall, got the push, and realized what happened... And, that it could be reproduced. If you want to see lots of slope soaring and lots of DS'ing, including interviews and demonstrations by JW, you can order the 'Lift Ticket' video from Dave Reese at Tuffpuppy@aol.com.



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The three Blackbird 2M versions: "Candide," constructed in 1985 and covered with white and metallic blue MonoKote, is on the ground. It's not been flown since 1993. The version in Bill's right hand, showing off its random pinstrip pattern, was built in 1993 and taken to Australia, hence the nickname "Galah." It came in third at the Lismore Glide-A-Fair. The newest version, "Cebú," described in this series of articles, is in Bill's left hand.

on the Wing

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The Blackbird 2M Project, Part 4

Well, our own personal schedules and the weather finally coincided, and our newest Blackbird 2M has been finished and test flown!

At the end of the last installment, the fuselage was yet to be fiberglassed, the wings needed to be covered, and all of the bare wood and fiberglassed surfaces were unpainted. We'll cover these items one topic at a time.

Fiberglassing the fuselage

Two weights of fiberglass were used, 1.5 ounce and three ounce cloth. Rather than use epoxy resin, we used the polyester type. We don't like to use epoxy resin when 'glassing a fuselage, as it's more expensive, takes longer to cure, is tricky to sand, and is not any more resistant to damage in this environment.

Our first task involved making a fiberglass cloth fillet along the line where the fin and sub fin meet the fuselage. Narrow strips of three ounce cloth, cut on the bias, were tacked in place with CA glue, and a stiff resin brush was used to apply the resin and obtain a reasonably smooth surface.

The sub fin and the lower portion of the fuselage nose back to the tow hook location were covered with the heavier cloth, as those surfaces get a lot of abuse. The remainder of the fuselage, with the exception of the wing root areas, was then covered with the lighter cloth.

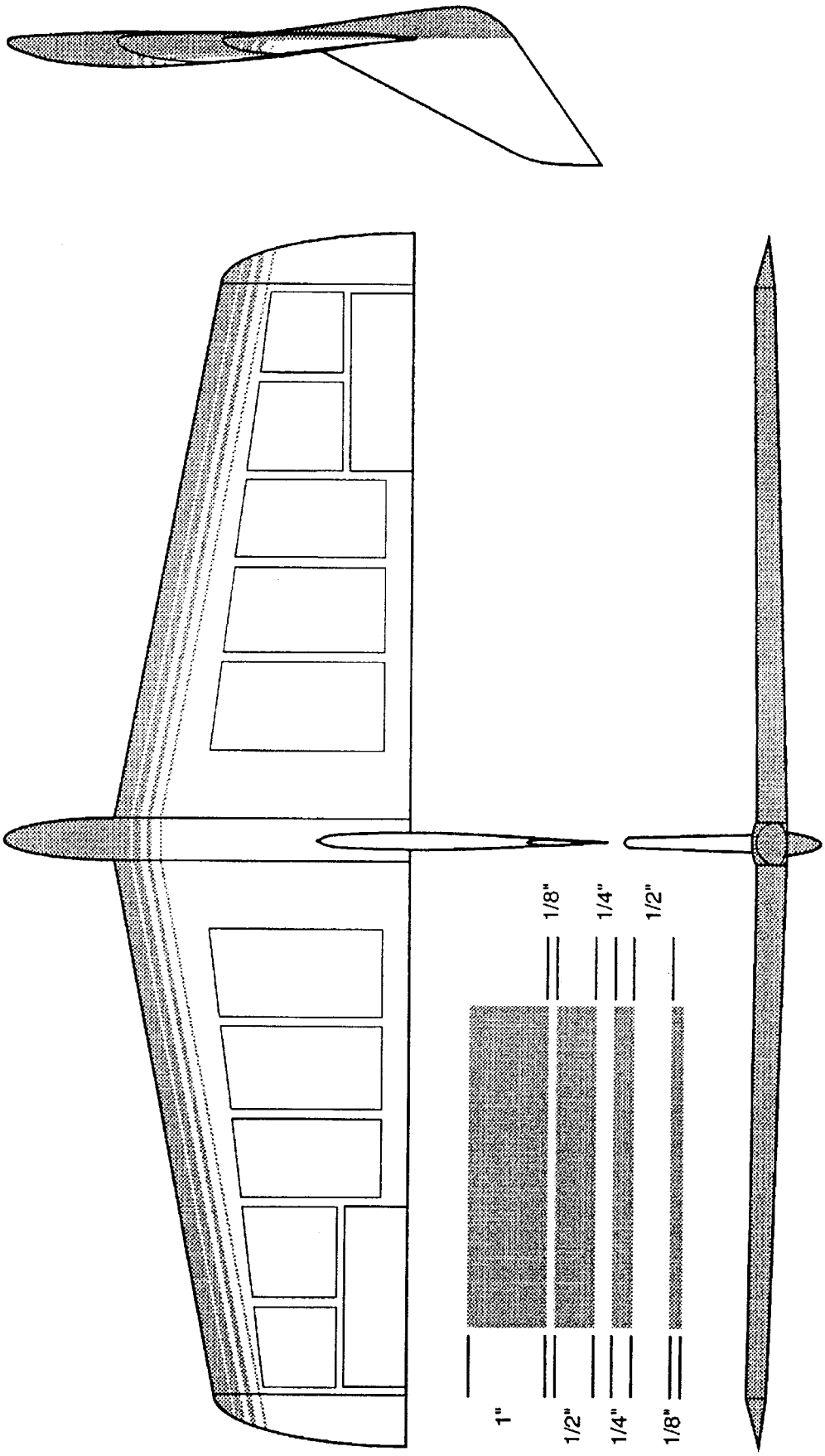
Flexible foam backed sandpaper and PermaGrit flats were used to eliminate excess resin and glass "flashing," and obtain a smooth surface for painting.

Covering the wing

We really like to have the upper surface of our aircraft a light color, and the bottom surface a dark color. From below, the pilot sees a dark object which is in contrast to the sky and clouds. When at distance, the light surface is visible as the aircraft turns toward the pilot, the dark surface as it turns away. While some trim coloring is OK, you don't want to overdo it, as the color desired contrast is easily lost.

On our second Blackbird, we used fluorescent yellow for the upper surface, and black for the lower. Pinstriping of the contrary color was then applied in a random pattern. Very simple to apply, somewhat complex in appearance, it has no effect at all on visibility. And we still get lots of positive comments at the flying field.

Looking through our collection of covering materials, we found more than enough MonoKote white for the upper surface, but not enough black or similar very dense color for the lower surface. Digging deeper, we found a roll of Pactra SolarFilm tropic blue. This color is not so dense as we'd like, but it does suffice. On a more positive

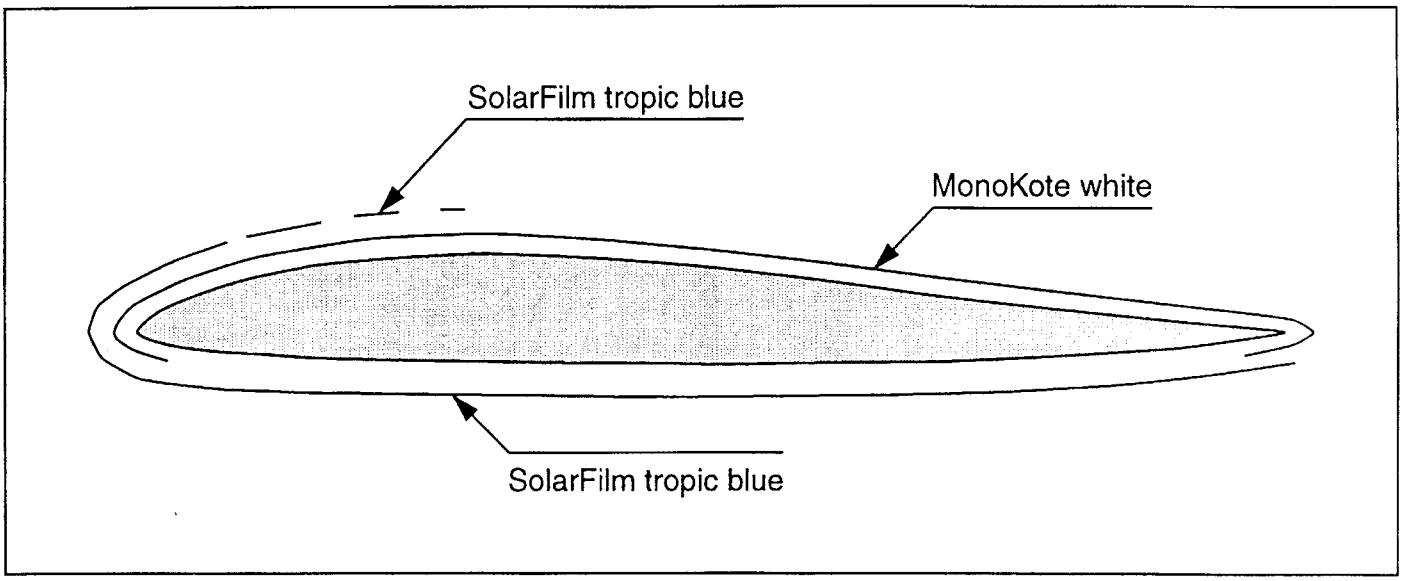


note, SolarFilm is applied at a lower temperature than MonoKote, some interesting color trim possibilities became possible, as we'll describe shortly.

We challenged our son, Dan-the-artist, to come up with a color scheme using these two colors. His immediate idea involved spray painting the colored trim onto a white base color. This meant spraying paint onto MonoKote, however, something we did not want to do. Taking the pinstriping idea a step further, he suggested making color strips of varying widths and varying the spacing between the strips. This would give the appearance of blended colors at a distance, as would have been obtained with spray painting, while appearing as simple striping when viewed at close range. Additionally, MonoKote would be used as the base, and the low temperature SolarFilm would then be easily applied over it.

Contrary to usual practice, the upper surface covering was applied first. The covering was wrapped around both the leading and trailing edges of the wing to eliminate creep. See the included drawing.

The lower surface of the wing was then covered with tropic blue SolarFilm. The covering was trimmed at the edge of the trailing edge and wrapped around the leading edge. A 1.25 inch strip of SolarFilm was then applied at the leading edge such that the aft edge is exactly one inch behind the leading edge as viewed from above. A half inch strip



was then applied one eighth inch distant, followed by a quarter inch strip at one quarter inch distance, and an eighth inch strip one half inch distant. See the included color scheme drawing.

The elevons were covered separately and then attached to the wing using strips of MonoKote and SolarFilm as hinging material.

Painting the fuselage

Zynolyte gray primer was applied to the entire fuselage and sub fin, the fiberglassed areas. Zynolyte primer is fairly versatile, and can be used under enamel, lacquer, and other types of paints. Additionally, it can be used to fill pin holes and other slight imperfections.

The entire fuselage, fin and subfin assembly was painted with three coats of Zynolyte white enamel and then masked to match the wing color pattern.

Matching paint colors to covering materials has always been a difficulty. While there are some specialty paints, such as those mixed to match specific MonoKote colors, we really wondered about finding a paint to match the SolarFilm tropic blue. Again, Dan to the rescue! He said, "Hey, I know a guy who runs an automotive paint shop, and he can mix up a spray can to match anything. Just give me a sample of the covering you want to match, and I'll get it for you." So we cut a triangle of about two square inches from the corner of the sheet, and, sure enough, three days later he brought a spray can of custom mixed enamel paint. And yes, it's a perfect match!

Here's the story on that custom mixed paint. Dan's friend, Nick Wahlberg, is a part of LDI Automotive Paints and Equipment in Tacoma, and is a wealth of information when it comes to automotive paints. The can he provided for our project holds 7.6 ounces of paint and propellant. Although we used an automotive acrylic enamel, the cans can also be filled with acrylic lacquer or an industrial oil based paint. If you choose an enamel paint, it can be placed in a can which has a fitting made for inserting the special enamel hardener. The acrylic enamel can take temperatures of 350° to 400° and is resistant to a wide variety of solvents. Dyes are also available for tinting vinyl, plastic, and some metals (interior use only). The acrylic paints give a glossy finish, while the dye imposes a semigloss or satin finish, depending on the surface. Both the enamel and lacquer can be flattened a moderate

Parameter	Candide	Galah	Cebú
Airfoil	CJ 3309	CJ $25^2$09	BW 05 02 09
Servo type, location, connection to elevon	JR micro, fuselage, GoldenRod cabling	Royal mini, wing, direct drive	Volz WingMaxx, wing, internal direct drive
Elevon hinge	Frise type, 1/16" mw axle	MonoKote, hinge on upper surface	MonoKote and SolarFilm, hinge on lower surface

degree, but this makes spraying more difficult. The price per can is a very reasonable $10.00 - this includes the color matching!

The paint matching process is, like most things these days, almost entirely computerized. Nick did run into some problems with our sample, as SolarFilm is extremely glossy and, interestingly, somewhat transparent. The color matching process is very delicate, and Nick found the color value changed depending on what material was underneath the sample. Although the computer did an acceptable job of matching, Nick's fine eye was the final authority.

The filled spray can is considered to be hazardous material, so shipping or mailing is not possible. Nick recommends that readers contact their local automotive painting establishments for similar services, but went on to say that he'd be glad to answer any questions *RCSD* readers may have. Contact information is included in the resources section of this column.

Radio installation and CG setup

We installed one Volz WingMaxx servo in each wing, as was planned during construction. These servos have small ridges on the side of the servo which snap into indentations in the mounting frame. Two small set screws are used to rigidly connect the servo with the frame. Getting a photo of the installation was impossible because access is from below and this exposes only the bottom of the servo. The linkage is not visible from outside the wing. A four cell battery pack was placed in the front of the fuselage, and the receiver placed behind the single plywood bulkhead. There's lots of open area left. Set up the control surfaces for neutral position with the transmitter trims in neutral.

We found the CG location on the most recent Blackbird and measured the distance to the wing leading edge at the root. This distance is seven inches. The tow hook on this airplane is 3/8" ahead of the CG. We've found that this location works well. Any further back and the 'ship comes off the line in the initial stages of the launch because of over rotation. We marked the identical CG location and tow hook placement on the new Blackbird, added a couple ounces of lead in front of the battery pack to place the CG on the mark, tightened the tow hook, and went out to the field.

Test flying

The initial flights of a tailless aircraft are the most treacherous, as they are quite sensitive to the CG location. We thought we had this one pretty well pegged from the outset, but with the different airfoil, questions remained. Bill held the aircraft overhead and ran into the wind, letting the wing try to lift itself. Any severe pitching can be easily felt this way, in our experience. With nothing unusual being felt, we proceeded to do the same again, letting the aircraft float ahead on its own with a gentle additional push. That first hand launch was just short of incredible. A very nice flat glide with no control input, and a landing spot about 15% further out than our most recent model. A second hand glide showed the same promise, with good response to elevator and aileron functions. The airframe was thoroughly checked over at home, and a second trip to the field was made for the initial winch launch.

A quick hand glide was made, and then it was on the winch line. The first launch was made with the same power as would be used for a polyhedral floater. This technique resulted in a good straight tow with a good release from the line. A turn to the right kept it away from the electrics. The stick was moved straight left and right several times in quick succession while flying straight overhead with very little proverse yaw in evidence. This is in contrast to others in this series. There's still some yawing into the turn before the roll actually starts, but this is certainly an improvement. Managed to fly into some light lift over the tall grass, and proceeded to circle a few times with obvious height gain. After some cruising, the 'ship was set up for a cross wind landing, per our usual practice, with good control maintained throughout. The overall impression is that this airplane flies noticeably smoother than previous versions, excluding the big XC version. The reduction in proverse yaw is a welcome change! Additionally, this airplane does not seem to be so prone to circle tightening during thermal turns.

The second winch launch was an anticlimax. Bill wasn't thinking about having a new airplane in his hands, but stepped up to the winch thinking he had the old standby on the line. A lot of line tension and a strong upward throw had her climbing out at an 80 degree angle. No letup on the winch pedal, just a smooth transition into the zoom with the winch still putting out uninterrupted power into the airframe. The zoom turned out to be about 50% higher than that obtained with the CJ $25^2$09 equipped version, a tribute to the lower drag of the BW 05 02 09 airfoil.

The last part of any project is to arrive at some sort of nickname for the completed project. Our first Blackbird acquired the "Candide" nickname because its first flight was very much like the music of the same name written by Leonard Bernstein. Our second received the "Galah" moniker while in Australia. The Australian Galah is a grey-backed, pink-breasted parrot which is both gregarious and

noisy, destructive and silly. For some reason the name seemed appropriate at the time and has never been changed. The newest model got its nickname from a breed of cattle, "sort of like a cow," which has a humped back. Three cartoon Cebú are featured in a "Veggie Tales" video, and our granddaughter has implanted their song into our household as a permanent fixture. ("Achoo moo moo," "Boohoo moo moo," "Mmm mmm mmm mmm...")

In all, this project has been an extremely positive experience for us. Although it took a bit longer than expected to complete, the results of this building project have been and continue to be most gratifying. We're eager to hear from *RCSD* readers who tackle the Blackbird 2M project, and are happy to answer questions and respond to comments.

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.)

LDI Automotive Paints & Equipment, Inc., 1108 S Center St, Tacoma WA 98405, (253) 383-5747. Contact Nick Wahlberg <nxter@netzero.com>.

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

Scott Gradwell
Medford, Oregon
scott@xcsoaring.com

The Montague Cross Country Challenge

Finally, it is time to slow down a little bit, at least for awhile. The Montague Cross Country Challenge was held at the beginning of June and I am sure, if you talk with anyone that was there, they will say this was the best one so far. This year's event was more competitive with a record number of teams entering, many teams having their best flights ever.

Saturday morning the weather looked perfect for R/C Cross Country soaring. After the pilots meeting, all the teams were ready to head out on course. Luckily no one knew that Mike Gervais' team (195) would fly for almost 6 hours and achieve over 66 miles or they might not have even tried. With this flight Mike Gervais was able get the first 100k pin handed out. As Mike was describing the flight later on, it was quite an accomplishment. Out on course their vario speaker battery died and they almost landed while his wife, Cindy, went looking for a replacement from the local residents. Luckily they found a sympathetic lady and were able to pop the new battery in before they landed and continued on course.

My team (OLY) was able to do 53 miles for second place and Mike Bamberg's team (807) flew 44 miles for third. After a hard day of flying everyone was ready to relax and enjoy the tri-tip barbecue.

The task for Sunday was a speed task using the turn points the team felt would give them the highest speed. The object was to accumulate as many miles as possible in two hours. The weather for Sunday looked a little less promising with high overcast cutting off some of the heating. Most teams eagerly headed out on course while Mike and I were waiting for the air to heat up a little more. When a band of overcast passed through, we both launched and Mike got on course almost immediately.

While I was working on gaining altitude, I collided with my father's SB-X/C. We were both able to recover but he could tell there was something wrong with his and landed. With a crease in one of his wing skins, his aileron twisted and binding, he was done for the day. I felt like my SB-X/C was flying OK, so we just gained altitude and headed out on course.

The flight went smoothly for the first hour and fifteen minutes, but we started getting lower and lower as the overcast thickened. The only promising choice was a junkyard and we were able to just make it there with enough altitude to begin thermalling. This kept us going long enough to get over the freeway and join a bunch of birds thermalling over a ranch. It took a little while, but we were able to get going again as the overcast thinned a bit. After we landed we were able to see our leading edge was split open about an 1/8" and the aileron servo mount was completely loose in the wing. Luckily we didn't land or we might not have tried this flight. When we got back and turned in our score sheet we ended up going the fastest and were able to take the overall lead for the contest. Now that I have won it is my turn to let my brother do the flying and see if he can win.

After this contest I decided to move from R/C to full size and participated in the SSA Sports Class Nationals. Since I have decided to concentrate on full size soaring and have many other commitments (getting my CFI, a new baby, teaching my boys to fly RC) I am going to have to give up writing this column. I have had fun writing the column and my only regret is not saying anything controversial enough to get hate mail. If you want to get in touch with me you can find me at www.xcsoaring.com.

Thank you. ■

Kit Review

The "JW" from Bowman's Hobbies

By Scott Hewett

Radio Control Glider Pilots throughout the world have experienced a gradual evolution of "foamy" aircraft in the last few years. We've seen various improvements in materials, construction techniques, aircraft type, planforms, airfoils, etc. It seems that every six months or so a manufacturer would make subtle improvements on an earlier design. The cumulative effect of all these subtle changes has made the foamies of today a vast improvement over the early days of "foamy" planes. It is obvious when you compare what we are flying on the slopes today with any of the early foamies. Remember the Anabats, Rubber Ducks, Floyds, Slingshots and other foamies of that era?

It is rare, indeed, when one particular plane impacts the hobby/sport with design and performance that far exceeds products on the current market. The JW by Bowman's Hobbies is such an airplane. It is one huge leap forward in the evolution of foamy aircraft, and history will prove its importance in the advancement of design criteria.

My first exposure to the JW occurred during October of 2000. Pat Bowman and Doug Turner arrived at an informal event called "Blancoween", which is held yearly at Cape Blanco, Oregon. Since the advent of Dynamic Soaring (DS), Cape Blanco has provided flyers with two DS sites. One is during the prevailing Northwest winds, and works great for fast composite planes. The other works well during the Southerly storm winds, but being smaller in size, it is somewhat limited to foamies and smaller composites flown by skilled thumbs. Pat had mentioned that he would be bringing up a couple of prototype planes called JW's.

When Pat and Doug arrived, there were already a wide variety of foamies in the air,
Dynamic Soaring in the Southerly winds. There were Sonics, Boomerangs, Zagis, Air Ratchets, and home brews, to name a few. Some were better at Dynamic Soaring than others, but for the most part you could say they were all in one class.

Enter the JW into the equation!

We didn't get much of a chance to look at them on the ground, as Pat and Doug launched almost immediately. The planform looked rather odd though, as it had a straight leading edge and the trailing edges swept forward. Many eyes were raised with skepticism.... After all, the rest of us were flying the most advanced foamies on the market! We thought, "Well, they might be able to keep up with us, and as such might be fun just to watch something different in the circuit." How wrong we were.

It became very obvious that the JW's were vastly superior at Dynamic Soaring than all the other foam planes in the air. The JW's were "lapping" everything else about every three or four laps. Not only were they much faster, but they tracked like they were on rails while punching through the turbulent boundary layer air. This allowed the pilots of the JW's the privilege of performing some DS aerobatics while still out-flying everything else in the air. It really was a sight to behold.

Mention should be made that all the pilots were of advanced or expert status, and the DS circuit diameter was roughly the same. We felt fairly comfortable with the assessment that the JW's were far superior to the other planes. Pat and Doug let fellow pilots fly their prototypes, and that is when the JW sold itself. All who flew the JW's that day made similar observations and comments regarding its superiority. One flight of Paul "Mr. Smooth" Naton was particularly memorable. Paul had that JW wound up so tight and close to the ground, with all the confidence in the world, that he made believers out of everyone present. Paul later mentioned that his brain was soon one half a turn behind the JW and that it took all the back stick he could give it!

In talking with Pat Bowman, I learned that the JW was named after Joe Wurts, who designed the airfoil especially for Pat. The airfoil was designed as a "task-specific/Dynamic Soaring" airfoil. One design criteria, which Joe Wurts designed into the airfoil, was low drag throughout the flight envelope, and it is quite obvious during Dynamic Soaring. There is a very fine article in *Q.F.I.* Magazine (*QFI* 49, Feb/Mar 2001) in which Joe Wurts enlightens the readers with his design process and considerations involved in the development of the airfoil. I highly recommend that article for those readers interested in the details. It makes for interesting and provocative reading.

I fondly refer to my personal JW as my "Jay Dub". It is the best plane yet for investigating prospective Dynamic Soaring sites. Pat Bowman cautioned me with one of the most common problems that JW owners do: too much elevator control. Follow Bowman's instructions and limit your elevator throw .25" up and down, and roll authority (aileron) to .5" up and down. The instructions call for the center of gravity (c/g) 1.75" aft of the leading edge. I've talked with a wide variety of JW owners whose c/g preference varies from 1.625 to 2.0625, depending on the conditions and personal choice. One thing is certain: The JW is VERY pitch sensitive, but with a little experimenting you will know when you have found the "sweet spot".

Since the plane was specifically designed for Dynamic Soaring, certain construction techniques vary from other foamies. The JW cores are the cleanest EPP cores I've seen. Bowman's Hobbies has to thoroughly clean the cores before they cut the upper AND lower spar slots for the double carbon spars. The double carbon spars create the most rigid EPP wing on the market, which is absolutely critical for efficient high speed flying. The JW uses 1.9 density EPP foam, which is heavier than most. Bowman feels that he needs this to provide the torsional rigidity that most foam planes just do not have. DS speeds definitely put foam planes to the test, and where many of them fail. Having "flutter" with a foamy is like putting a governor on an engine. They can only go so fast. Bowman and Wurts addressed that issue as a primary consideration in the airfoil design and construction methods.

Some "DS" pilots are installing ballast tubes in the fuselage or wing, and tout the performance when conditions warrant. I stopped putting ballast in foamies years ago, as they would just become "flutter monsters". But with a foamy as rigid as the JW, it may very well be an option worth having available.

The "JW" Specifications:

Construction Type:	1.9 density EPP Foam
Aircraft Type:	Flying Wing
Planform:	Plank Type, straight leading edge, forward sweeping trailing edge
Wing Span:	54"
Wing Area:	479.25 square inches
Length:	22"
Flying Weight:	32 ounces
Wing Loading:	9.61 ounces per sq. foot
Aspect Ratio:	6.08
Airfoil:	Proprietary (Joe Wurts)
Task Specific:	Dynamic Soaring

Construction methods of this EPP foam plane are similar in many aspects to other foam planes on the market, with a few important differences. To insure the rigidity required for efficient DS flight, the JW has two spars... one above the other. Both spars are 1/4" carbon tubes. Bowman recommends gluing the spars in with thick CA glue or epoxy. He does not feel that Silicone offers enough rigidity because it allows the wing to flex too much. One thing is certain. Once the upper and lower spars are installed, you will be amazed how rigid this EPP foam wing is.

If you are planning on DSing this plane, take Bowman's recommendation and use metal-geared servos from your favorite manufacturer. At Dynamic Soaring speeds, plastic gears will strip much too often in crashes. Save yourself many headaches later and invest in metal-geared servos in the beginning. I use Airtronics 141's in mine because I have a large surplus of that type, but Hitec HS 225MG's or HS85MG's, or Futaba/JR/Multiplex/Volz equivalents will do just fine. Any metal-geared servo less than 5/8" thick will fit in the wing.

The instructions and plans for the JW are detailed, thorough, and explicit. The plans I received consisted of three pages of text, and eleven pages of helpful diagrams and pictures. The contents of the kit are as complete as you will find in the marketplace today. The only items you will need are: adhesives, strapping tape, covering film, and radio gear. As you inspect your kit, pay particular attention to the cleanest set of EPP cores you'll ever see. As for options, you may want to consider using a 5-cell battery pack, since you will probably have to add a few ounces of nose weight anyway to achieve the proper balance. You will also need longer servo leads or extensions because the servos are placed about mid-span of the elevon length to eliminate twisting of the elevon at high speeds.

This plane is FAST at Dynamic Soaring, so don't try to shortcut any detail in the construction sequence and methods just because it is a "foamy". High-speed crashes are tough on foam, but if you do happen to break off a nose or tail, a simple "Goop" repair will get you back in the air.

Bowman recommends a couple other points in surviving high-speed crashes with the JW. Round the leading edge of the wingtips. That helps in preventing getting tips snagged and torn off during crashes. Do not glue the vertical stabilizer into the fuselage slot, but rather install it with tape as recommended in the instructions. If glued in, the fin will tend to tear out part of the fuselage in violent crashes. Also, if the coroplast fin becomes bent or needs replacement, it is a much easier job to do if it is not glued in.

Ultracoat is the highly recommended covering because it stays clean longer and requires a lower temperature to do a good job on EPP. Bowman stresses to NEVER use a heat gun because it is too easy to damage the foam or shrink the covering too much and alter the airfoil or remove the washout. He says to use a hobby iron and keep it moving!

The JW was NOT designed for foamy combat. This is not to say that you cannot do it, but do not expect to win many battles against swept wings. And, don't expect to keep your JW in the finely tuned shape that efficient Dynamic Soaring requires. Combat damage will slowly, but surely, degrade the performance of a foam airfoil with every hit and crash. If you want to keep your JW in shape for Dynamic Soaring, stay away from the foamy-furball combat action. The fact is that the swept wing foamies will tend to "right themselves" after a combat hit, allowing recovery easier. The JW will be able to come in at a higher speed and perform surgical hits on the other foamies, but oftentimes will spin to the ground before recovery. It is something like "knocking yourself out".

As for Dynamic Soaring performance, you'll be amazed once you hit the circuit with other "foamies". Bowman and Wurts put together a combination here that will thrill you like no other foamy can in Dynamic Soaring. Wurts uses different airfoils at the root and tip, and designed in just enough washout to afford the stability he felt necessary in turns, and turn it does! I've never seen an EPP foam plane pivot about its axis and maintain energy as well as the JW. I had the pleasure of watching Pat Bowman demonstrate the JW to me at Parker Mountain in Southern California earlier this year. Some guys have good thumbs. Some guys have good planes. Pat has both, PLUS he is thinking 3 turns ahead of the plane. He literally gave me a sore neck trying to keep up with him... all the while flying on the backside of the hill. He would have his JW wound up so fast, then roll it inverted and continue on as if nothing had changed. Next he would throw in a couple rolls, pop up and outside loop the JW while I was still trying to figure out what he did thirty seconds before. If you know pilots like him, you know what I'm talking about. Poetry in motion!

So, what makes the JW different, and why does it work so well? I have discussed this with a number of JW owners, and three things are mentioned most often: airfoil, planform, and rigidity.

I have to agree with the three items above, but sometimes wonder if the name "JW" implies that it "**J**ust **W**orks"... for reasons we'll never quite understand. This really is an exciting time for our hobby/sport. The JW is not just a subtle little advancement like so many other changes we have seen in the evolution of foamy flight, this little plane is leaps and bounds ahead of the pack. I applaud Pat Bowman and Joe Wurts for opening a new door of excitement for all of us in the phenomena of Dynamic Soaring!

If you are interested in obtaining a JW, they can be ordered directly from Bowman's Hobbies. Availability is normally within seven to ten days by contacting:

Bowman Hobbies
E-mail: pat@bowmanshobbies.com
Ph: (661) 296-2952, Fax: (661) 296-9473
Web: http://bowmanshobbies.com

Bowman's Hobbies
21069 Susan Carole Drive
Saugus, CA 91350

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GORDY'S TRAVELS

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"Getting Your Head-ing Straight On Contest Landings"

One of my recent travels was to Huntsville, Alabama for the Mid-South Soaring Championships where the landing zone has become a tradition.

If you picture shuffleboard with point divisions for greater points earned the closer you get to the point, and you have the zone.

The shape of the zone often confuses or complicates a pilot's attitude toward the difficulty of the zone, but in reality it is actually just a combination of the usual circle landing tape and a runway landing.

A Circle Tape landing zone has the 100 point mark at its center, the far end of the tape being zero. The tape can be moved around the circle's circumference, to meet with the nose of a plane in order to determine points.

A Runway Landing Zone is an anchored length of tape with 100 points located on top of the tape anywhere along its length. A measuring stick with point graduations is used to measure from the tape to the plane's nose, with the points declining the further from the tape the nose rests.

Let's look at the ShuffleBoard design used at Huntsville's Mid-South. It is similar to the Circle Tape system as, at its base, you have some room from its center for the plane's nose to be off, yet gain a set amount of points (same as being 'in' the circle). Also, like the Circle Tape system, points are gained by being closest to its point. So, what appears to be a modified Circle Landing Zone... is actually mostly a modified Runway Landing Zone.

Picture a straight line from the point, through the center of the ShuffleBoard, intersecting the base line as a 'Runway'. The space of the ShuffleBoard design then has no significance to the landing task.

Your goal for your landing approach if set up early so that it was on line with that intersecting line (the runway), your odds of making landing points are greatly improved. However if your approach is off line then is when the shuffleboard's declining width becomes a factor.

In every case of missed landing points (short or long), the pilot was off line and tried to correct in the zone.

So, here's Hint Number One for improving all landing task results:

Line up way out and keep your plane's approach dead on that line, up the center of the zone. That way, regardless of the shape of the zone, you are sure to gain some points even if you slide forward some.

If you are busy steering your plane's approach as it nears the zone, you are too busy to pay attention to speed and altitude. Why not reduce your worries on approach and get that plane on line way out?

START USING YOUR LEFT THUMB! Yes, the rudder. It and only it will get your plane's angle to change. Ailerons will get your plane really moving around, a sure way to hook a wing tip or spin out on the landing. During your practicing, get on that rudder stick and see what it does for you and your plane. LEARN IT!

Another thing that causes landing point loss is 'spin-outs'. That's when you come in and your plane's wing tip hooks the ground and spins the nose out away from the points. What's the fix? Maybe longer Skegs? Nope.

The next key to improving your landing results is to approach low. Think of the nose of your plane as the point of a Toy Top. When the nose contacts the ground, it acts as a pivot (or the Nose Skeg does), allowing any centrifugal energy your plane may have, as a result of an off line approach or wind gust, to spin the plane. Not to mention that a high approach is more likely to get ballooned or diverted by some ground effect as you approach.

Hint Number Two

Burn your altitude off early. Make sure that when your plane is about 50' out, in front of the zone, that it is no higher than 3'! Anything higher than that will cause you to panic once in the zone. Plus, the perspective is distorted complicating your ability to evaluate speed and position. Get that plane down!

This is where a 'good' timer can be helpful. Ask him to remind you, during the approach, to "get your plane on line" and to "get your plane down".

You should practice. But practice seeing that imaginary runway 'rail' extending in front of you from the tip of the landing area, and putting your plane on that 'rail' during your approaches.

I mentioned 'perspective'; too often guys will stand with their feet right at money end of the landing zone. That's why you see so many dinged wings and sore shins!

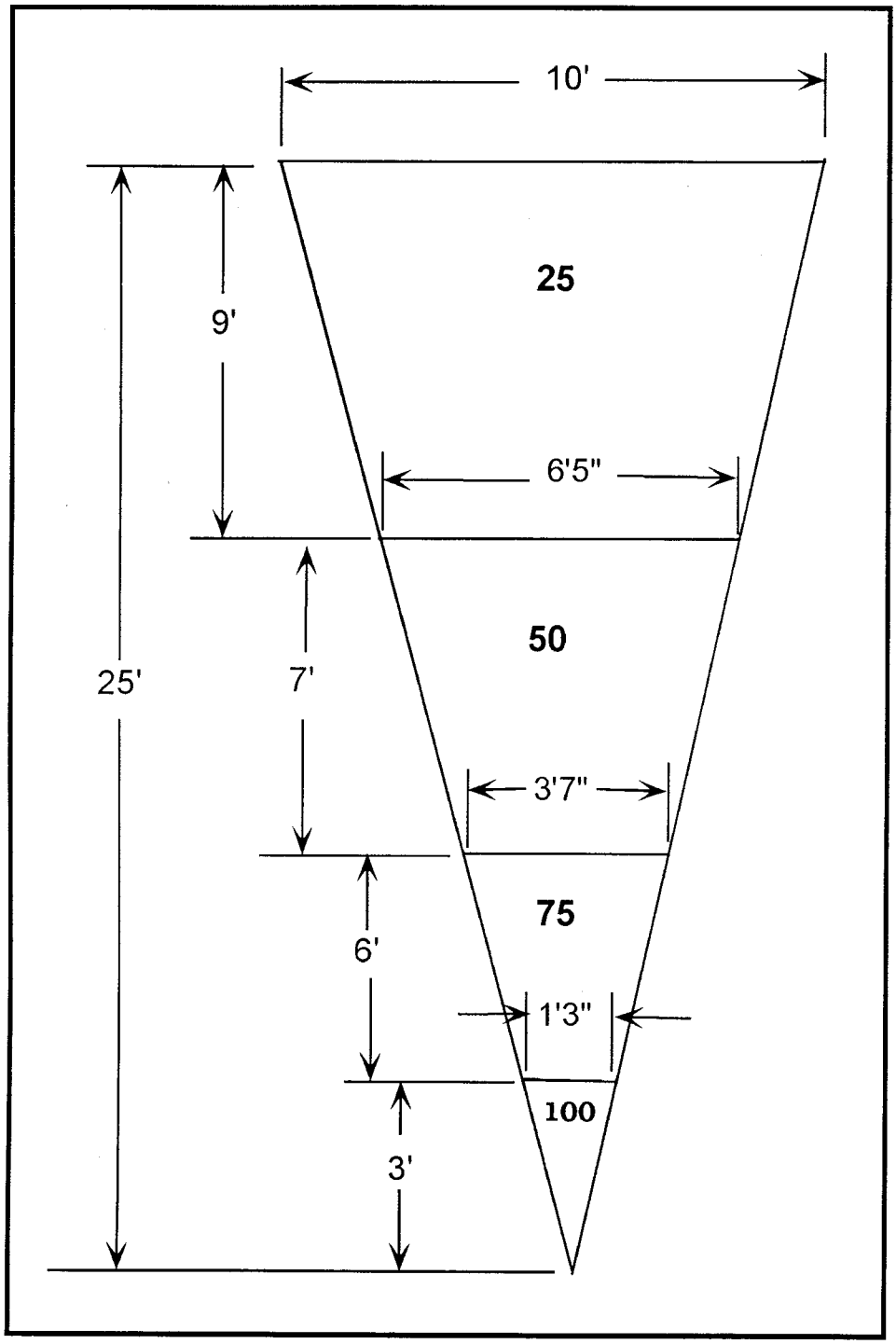
Advise your timer to get you set up a good 5' plus away from the end of the zone so that you don't have to rush a splash down and you can fully SEE the entire zone and the plane. You'd be surprised at how much more comfortable you will feel about landings when you remove yourself as a 'target'.

What about landing short or long? Easy answer!

We all kick ourselves for going for a few extra time seconds, then missing a potential for 100 points of landing, and missing the landing, too. Missed because we got rushed on the set up.

Learning your abilities and your plane's abilities goes a long way here but, basically, get real with knowing 'when to hold them, and when to fold them', when it comes to setting up for your landings.

You will always be short if you are rushed on set up, because you are



usually turning and losing airspeed to set up for the approach. You need lots of airspeed to have some extra to control. Yes, 'control'. You know - those flaps and mixing you are always futzing with? You will always be short if you think you need to be slow.

Hint Number Three

Your approach should be fast, not slow like we all seem to dream about. Slow means no airspeed; no airspeed means no air over our surfaces, and that means no control. Fast means that you have lots of control and, IF YOU ARE LOW, then stopping is no problem. That's where our skegs go to work. No chance of over shooting either, because the chance of damage from pushing over to get that skeg to work is not going to cause damage to the airframe... And, both skegs will go to work immediately, not just the nose skeg.

What about using those landing flaps? The popular thing to do is set them up at 90 degrees "to really stop her!" Fact is, that is kinda dumb. Once your flaps are at 90 degrees, you no longer have a wing, the plane is not under control, and it's barely flying. Pretty much, it's a bunch of parts flinging at the ground.

Stop thinking of that stick as the 'Landing Flap' control and start thinking of it as your 'Throttle'. (Altitude is controlled with elevator!!!) So, start with using it as camber prior to turning in for your base-leg approach. (That's first left or right turn prior to turning toward the zone.) That means your plane's airfoil is dirtied up, providing some slow down. Then, add more once on the approach. Work your elevator to get you down. Don't use your 'Landing Flap' for that, or you will end up 'out of energy' to get to the zone. If you are on line and down near the ground as you approach, as your plane nears the base of the zone you can then pull all your Landing Flap travel down; but you will still use ELEVATOR to place your nose on the spot! No hoping that it will plop in the right spot.

Prior to an event, make up a portable landing zone, just like the one at that contest, and use it. I used a length of rope, laid in a V shape, to simulate the ShuffleBoard and, other than one 'out', I averaged 75 points for the event. It got me used to imagining that 'centerline' was my real target.

Every game, whether golf, tennis or soaring, is always said to be won in the head. Getting your head—ing straight, your altitude set and having speed to control will help you keep head straight under the pressures of the clock.

Hope you enjoyed this trip! See you on YOUR field!

■

Okay here's a recap:

USE YOUR FLAPS EARLY in the approach pattern and during for speed control, not altitude control.
PRACTICE USING YOUR LEFT THUMB, rudder only for staying on line.
PRACTICE APPROACHES and landings; don't just sort of land.
GET ON LINE way out, no circling into the zone.
GET THAT PLANE DOWN to less than 3' at 50' from the zone.
COME IN FAST - no not like a rocket, but with a medium-like walking speed.
STAND BACK at least 5 feet from the zone's 100-point area.

TECH TOPICS

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Last month, we looked at optimizing HLG designs using our polar analysis program. By way of summary, we learned:

1) The MA409 type airfoils (~ 9% thick, ~ 2% camber), appear to favor an aspect ratio in the 10 - 12 range for best overall performance in a HLG planform,

2) The S6063 type airfoils (~ 7% thick, ~ 1% camber) appear to favor lower aspect ratios in the 8-10 range,

3) The S6063 design will launch higher in discus mode but will lose to the MA409 under dead-air, minimum sink conditions,

4) Use of camber control for the S6063 MIGHT improve low speed performance to even the score at that end of the flight envelope.

With these ideas in mind, let's go back and look at the S6063 planform in more detail to see if we can't 'tweak' it up a bit. First let's go back and review a few of the design premises.

We suggested a 3 servo design (rudder, elevator and camber) when we probably should be looking at a 4 servo system (flaperons, rudder, elevator). After destroying a R/E ship trying to learn discus launch, I now think that both roll and yaw offset would be helpful for the launch preset. This is only a small weight change (assuming S60 type servos) but we'll add that in for this analysis.

We also optimized the planform based on the low speed end of the performance envelope (minimum sink speeds). During a high speed launch, the low Cl obviates the induced drag contributions but the larger wing area may increase the total profile drag even though the total Cd is low. So we need to consider aspect ratio effects during the launch phase as well.

To spread out the trends a bit, we'll consider three aspect ratio conditions for this month's study. We'll design around aspect ratios of 6, 10 and 14 for a start. Refining the analysis near one of these conditions will be left as an exercise for the student.

Using the weight correction noted above, and the planform assumptions (RVC, TVC) from last month, our polar results are shown in Figure 1 for the three conditions. As can be seen, we get a slight advantage in minimum sink value as we optimize aspect ratio. What we're really trading off here is the reduction of induced drag from the high aspect ratio against the increased wing loading. Somewhere in the 8-10 range seems about right (as we found before).

We do get a noticeable shift in the cruise velocity at which minimum sink occurs and I think that's important when considering HLG design. A lower flying speed would be preferred to core those low, tight thermals we encounter in HLG flying. My personal preference is to get down around 15 ft/sec if at all possible. Where we suspect the problem will lie, however, is that the larger wing area of the low AR case will detract from our ability to obtain greater launch heights.

In Figure 2 we've plotted the total drag coefficient for each planform up to a launch speed of ~ 70 mph. As expected, the drag coefficients diverge at lower speeds where induced drag starts to dominate. Fortunately, this accounts for only a small part of the launch phase (near the top). The slight reduction in total Cd at high speeds for the lower aspect ratio is probably due to Reynolds number effects (wider chord).

In Figure 3, we've repeated the launch height calculation from last month for the three aspect ratio cases. As suspected, the larger wing area of the low AR design degrades the launch performance of this approach slightly. Unfortunately, although a higher

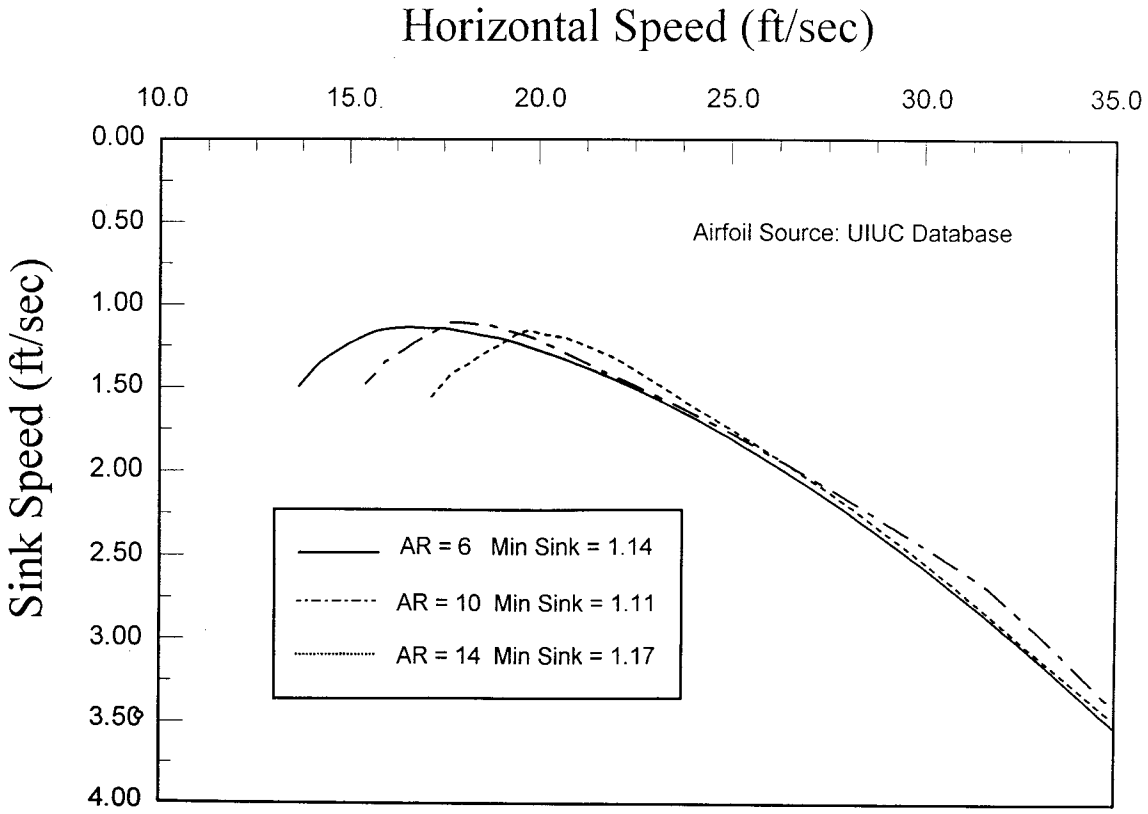


Figure 1: Aspect Ratio Effects For S6063

Figure 2: Aspect Ratio Effect on Total Drag Coefficient

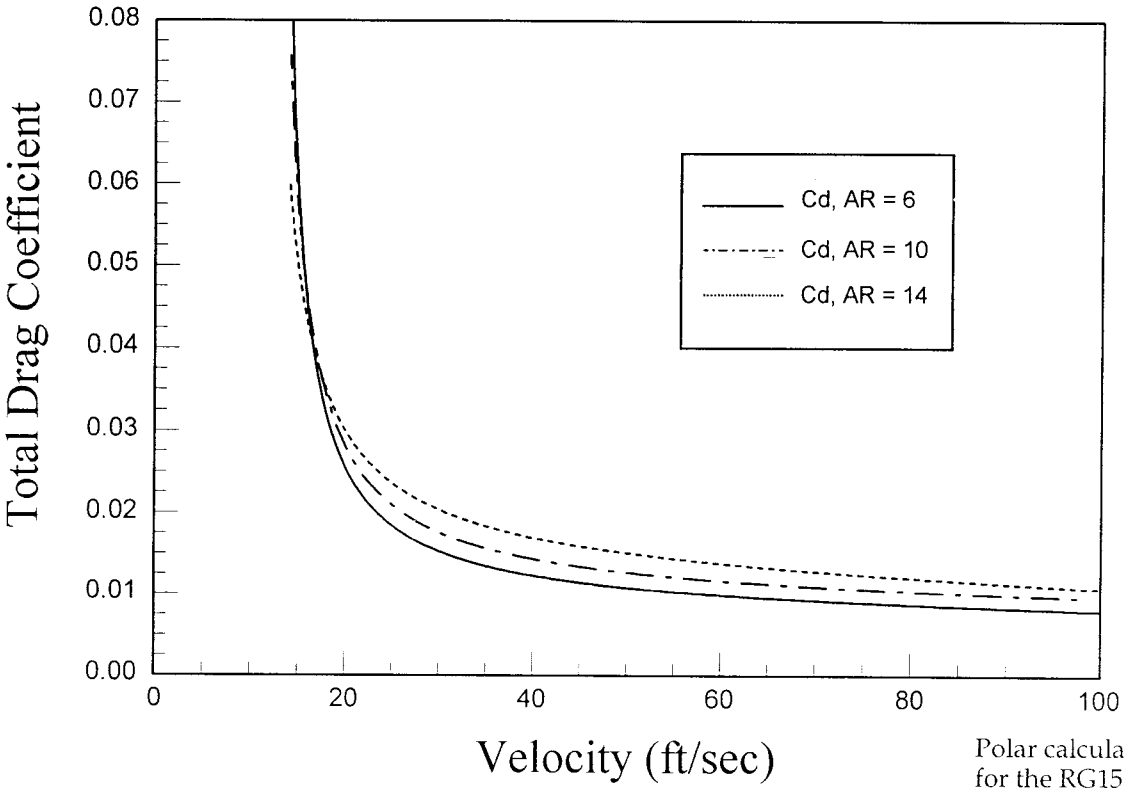


Table 1: Estimated Flight Times With Planform Change

Aspect Ratio	Weight(oz)	Height(ft)	Min Sink(ft/s)	Total Time(s)
6	12.7	126	1.14	113
10	9.3	134	1.11	123
10	15.0	148	1.33	114
14	8.4	140	1.17	122

aspect ratio improves launch height, cruise speed for minimum sink is not very favorable. Thus the need to consider camber changes for launch and thermal conditions.

Although there is a height loss due to the lower aspect ratio, it's not as bad as we might have expected. After all, a ship with AR=6 is carrying over twice the wing and tailplane area of a ship with AR=14. There are at least two things to keep in mind:

1) A lot of what we're fighting is gravity. So viscous drag isn't the only limit for launch height,

2) If we increase the mass of the plane (lower aspect ratio case), a higher launch height may be expected. IF the same launch velocity can be achieved, the heavier ship carries more kinetic energy. In a purely ballistic model, this wouldn't make any difference but the viscous drag effects are not mass dependent so it is a consideration for this model (i.e., you might want to use weight as a variable to optimize HLG performance!).

To illustrate this last point, we've also plotted the estimated launch height for the AR=10 case but with an all up weight of 15 ounces. A noticeable increase in launch height is obtained. However, the higher wing loading seriously degrades the minimum sink performance so this may not be an attractive approach.

Bottom line - assuming a 75 mph launch speed, the dead air flight times for planforms with no flaps using a S6063 airfoil are summarized in Table 1. The time includes the launch time and flight time at minimum sink conditions. So it does appear that a slightly higher aspect ratio (~ 10) is favored for this design if the launch height and minimum sink trade-offs are considered as performance variables.

At this point, we'd like to find out if camber changes can help modify the thermal performance of these designs. Unfortunately, we don't have flap data for the S6063. However, we do have flap data for the RG15. So we'll use this airfoil to understand the trends we might expect with the S6063.

Polar calculations for the three AR cases for the RG15 are shown in Figures 4 and 5. Here we've looked at the 0 degree flap airfoil and the 10 degree flap case.

Although the 10 degree flap case really doesn't improve minimum sink, it does affect the speed at which minimum sink is attained. Notice that the minimum sink positions in Figure 5 are all shifted to 15 ft/sec or less as compared to values > 15 ft/sec for Fig 4.

What's probably happening here is that the increase in lift capability of the airfoil is being offset by both the higher induced (Cl) drag and the higher profile drag for the flapped condition. However, it is apparent that we can reduce our speed for thermaling (~ 15 ft/sec) at an AR=14 which we couldn't achieve without the camber change. The reduction in cruise speed is about 11% while the reduction in minimum sink speed is around 1%.

So the advantage would not necessarily be an improvement in minimum sink, but an improved capability for a high AR design to fly slower at minimum sink. Since the minimum sink capability is only marginally changed for the flapped section at 10 degrees (as compared to the flapped section at 0 degrees), there isn't much point in repeating the launch height calcula-

tions.

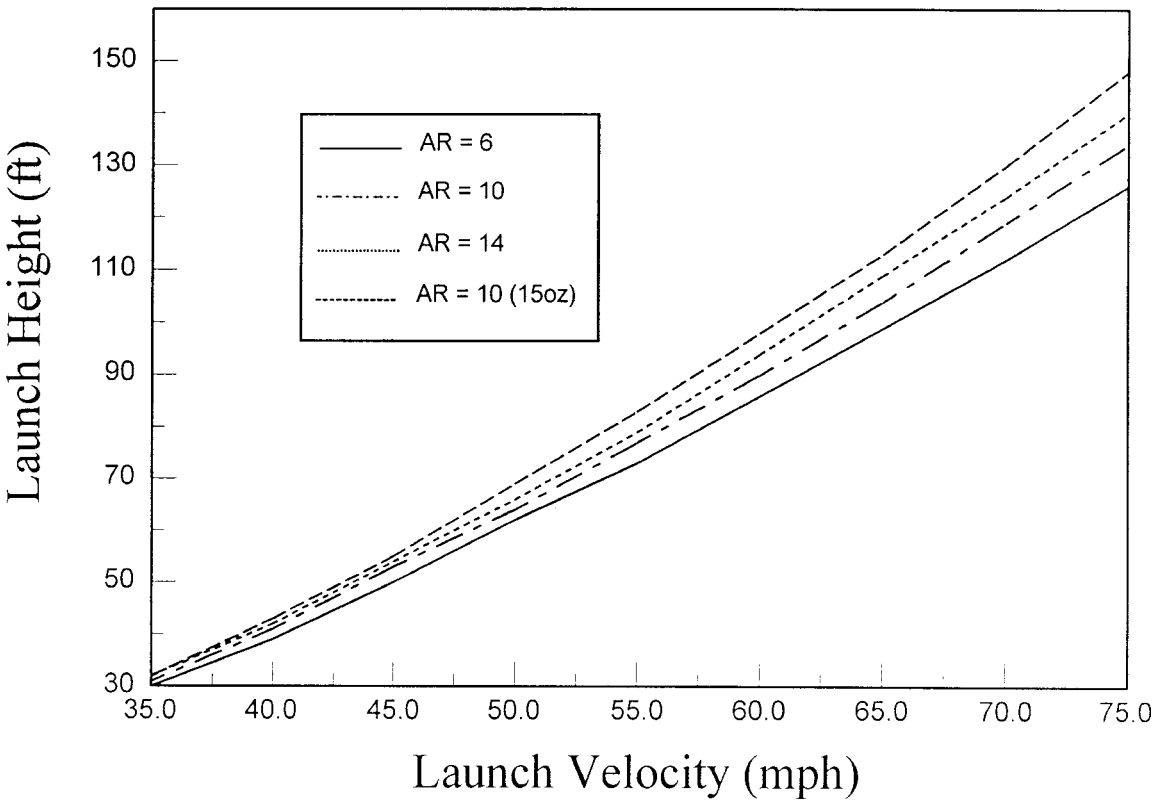
Unfortunately, we can't completely close the loop here since we don't have data from the UIUC database on the S6063 with a flap. However, the general trends for the RG15 strongly suggest that adding flaperon capability to the S6063 planform favors a slightly higher aspect ratio design than we estimated last time. Launch height should be improved relative to the lower AR design. Minimum sink should not be significantly affected but the capability to core a small thermal should be better.

Although we've focused on an aspect ratio near 10, this analysis can certainly be refined a bit to zero on an optimized aspect ratio for the entire flight envelope of the design. As noted previously, the final details will be left as an exercise for the student (gotta retain a little bit of competitive advantage here!).

To conclude, the planform with an unflapped S6063 airfoil is estimated to produce about 120 seconds of total flight time if launched at 75 mph. If a flap is added, only marginally longer dead air flights may be expected.

However, the more significant advantage is the ability to slow down to less than 17 ft/sec to core those low, light thermals. Even if dead air flight time isn't enhanced, the expansion of the speed envelope should provide considerable

Figure 3: Estimated Launch Height Vs. Aspect Ratio



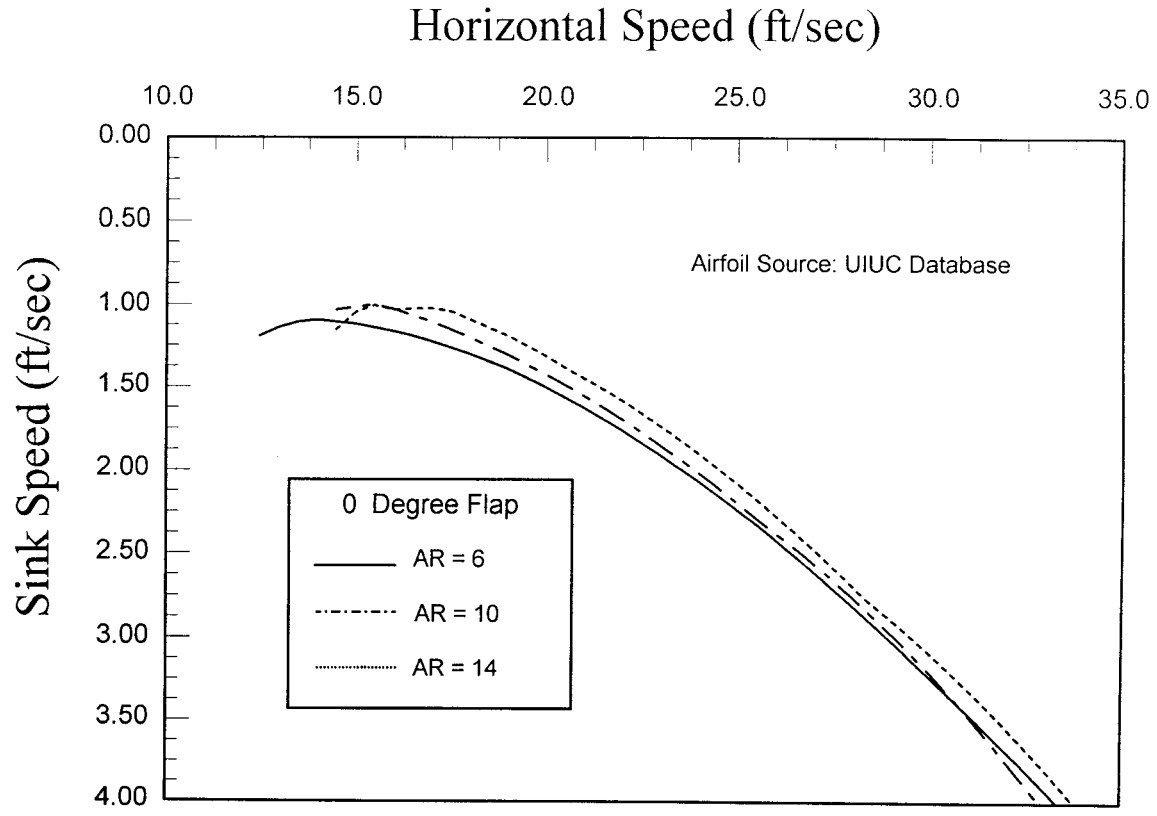


Figure 4: RG15 Polars With 0 Degree Flap Setting

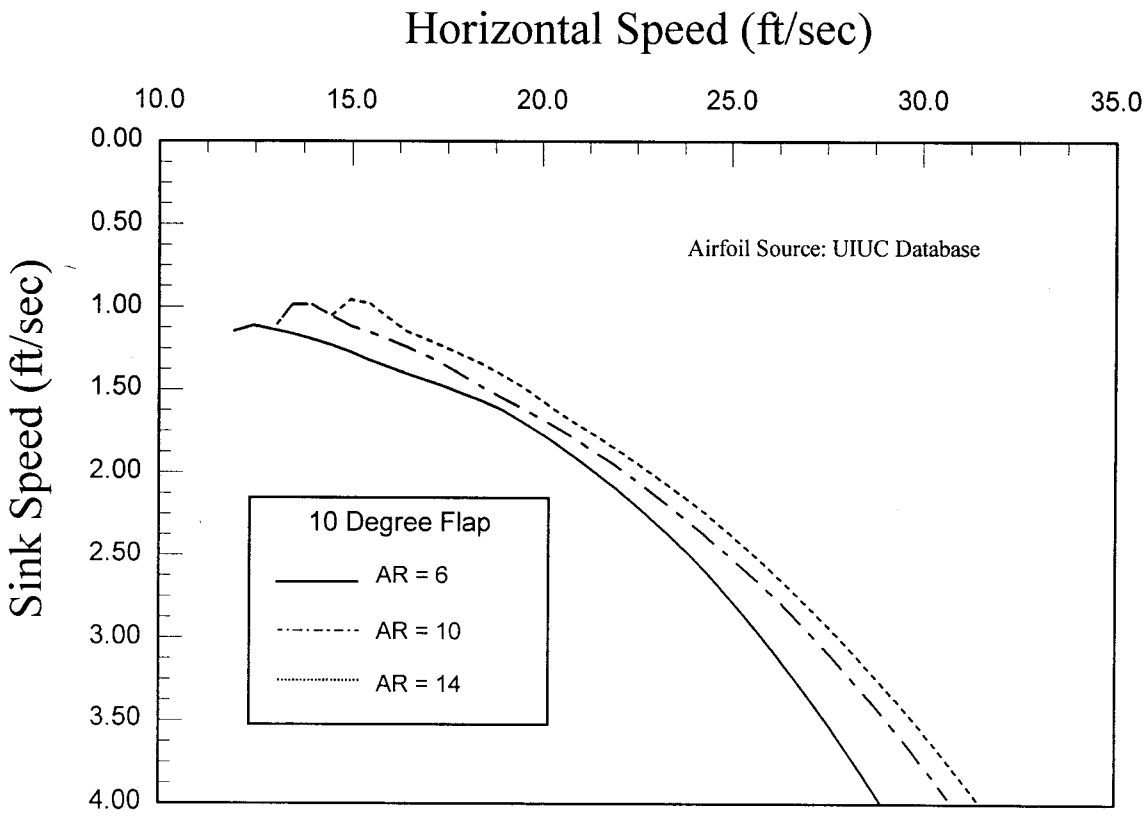


Figure 5: RG15 Polars With 10 Degree Flap

flexibility for this type of design.

So for this month's exercise:

1) Higher aspect ratio (>10) favors improved launch height with the S6063,

2) Adding flaperons expands the flight envelope of the design, and

3) We need additional research on low camber, flapped sections for HLG applications.

Next month, we'll drop the math and share some beginner's experience (me) with discus launch. Or, "How to destroy your plane while still trying to learn new design techniques." ■

THE NATURAL SIDE OF THERMAL SOARING

By Lee Murray
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Wind Direction and Speed from Weather Charts

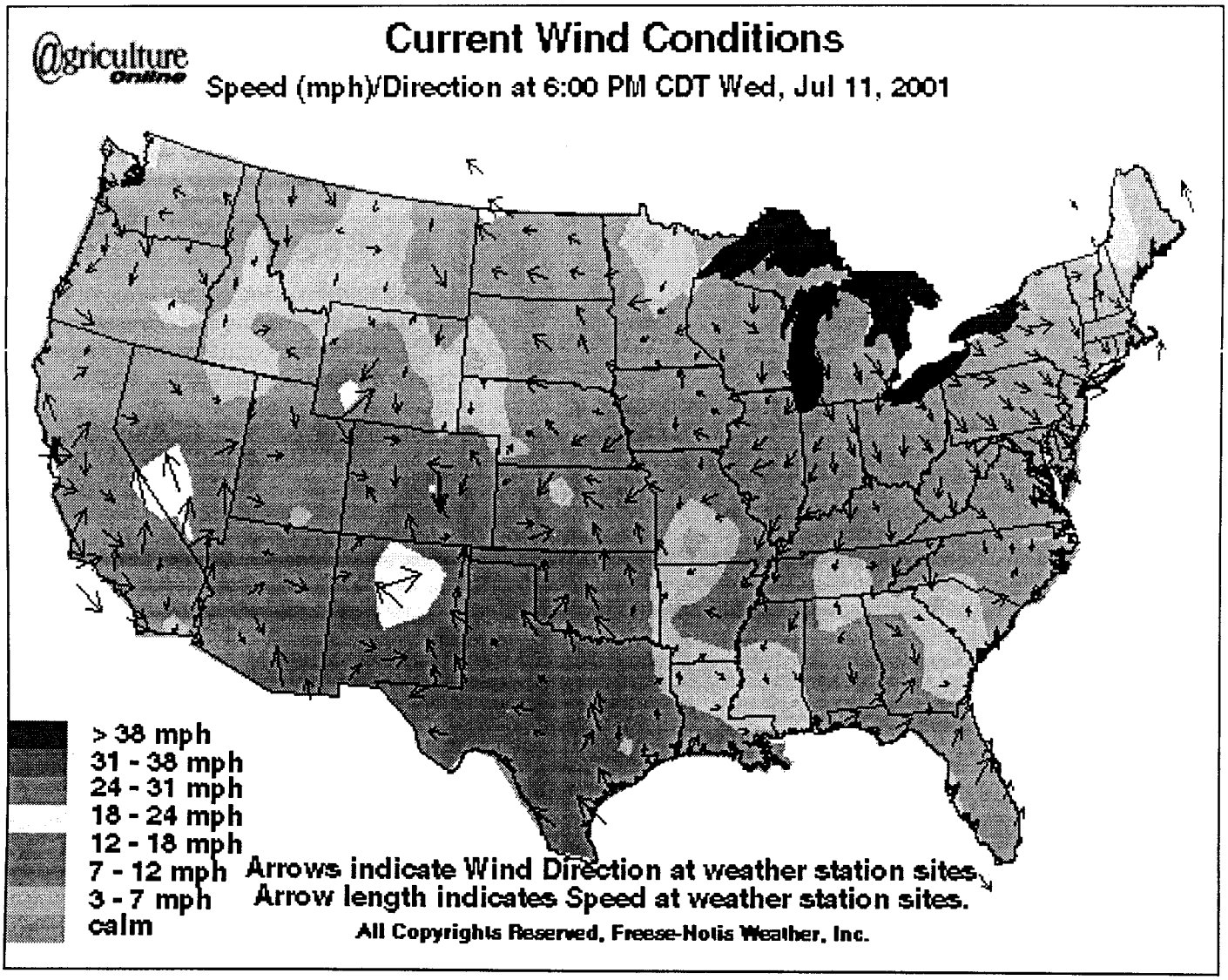
A topic that I have wanted to cover for some time deals with wind direction and speed, and the values they have for the modeler. The flat land glider pilots in my club want to see a southerly wind. A northerly wind means we must walk over 900 feet, with equipment, to a place on the sod farm where we can launch. This also means that the temperature will be colder than normal. We don't have that many hot days in NE Wisconsin. All in all, we have a larger group on warm days with a southerly wind. If the wind is over 20 mph, as it often is, we would choose to fly models that can handle that speed vs. selecting light models best flown under light and variable wind conditions.

To the slope soaring enthusiast, wind direction and speed mean even more. It means selecting an appropriate site. The Silent Flight Group of the Valley Aero Modelers is growing into an Eastern Wisconsin Silent Flight Group. We are electronically connected by the Internet. The group includes members who fly slopes all over Wisconsin. Mirko Bodul lives in Milwaukee but travels with his work. He keeps slope soaring models in his station wagon. Photos of WI slope soaring activities can be sampled from www.slopeflyer.com. This is a great slope soaring web site where you can get a listing of slope locations by state. *RCSD* has had some great articles with more details on slopes as well. E-mail is occasionally sent telling us where people will be sloping that day or the next day.

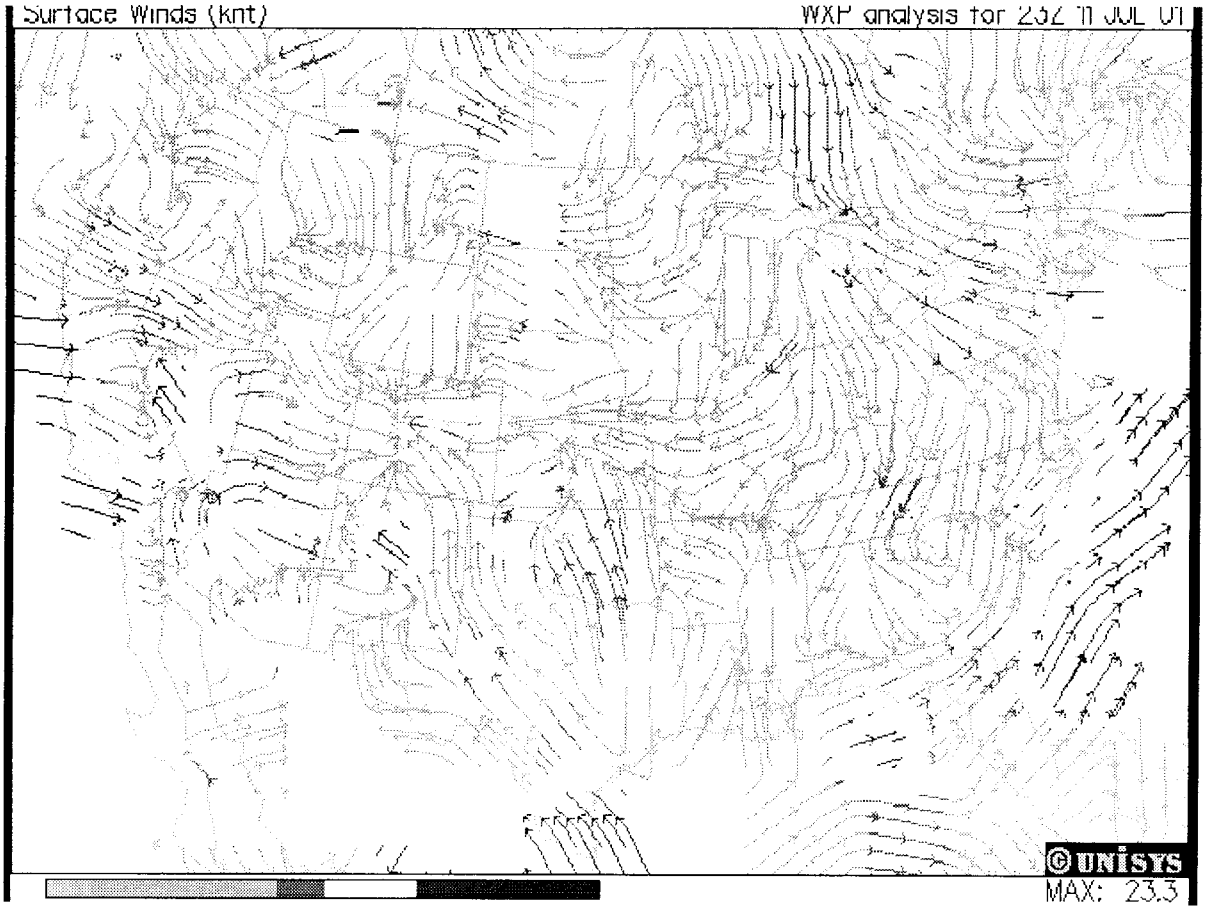
Local TV news and weather is sometimes a good source of wind information, but often lacks the detail we need. And if where you want to fly is not near a population center, you may want to access other information on these topics. Here are some tools to help you determine what the conditions will be. My comments do not apply to offshore winds that have other controlling factors.

Wind Direction:

Most everyone knows what the prevailing wind direction is where they normally fly. In the Midwest, the



http://www.agriculture.com/agweather/maps/windsp.html



http://weather.unisys.com/surface/sfc_stream.html

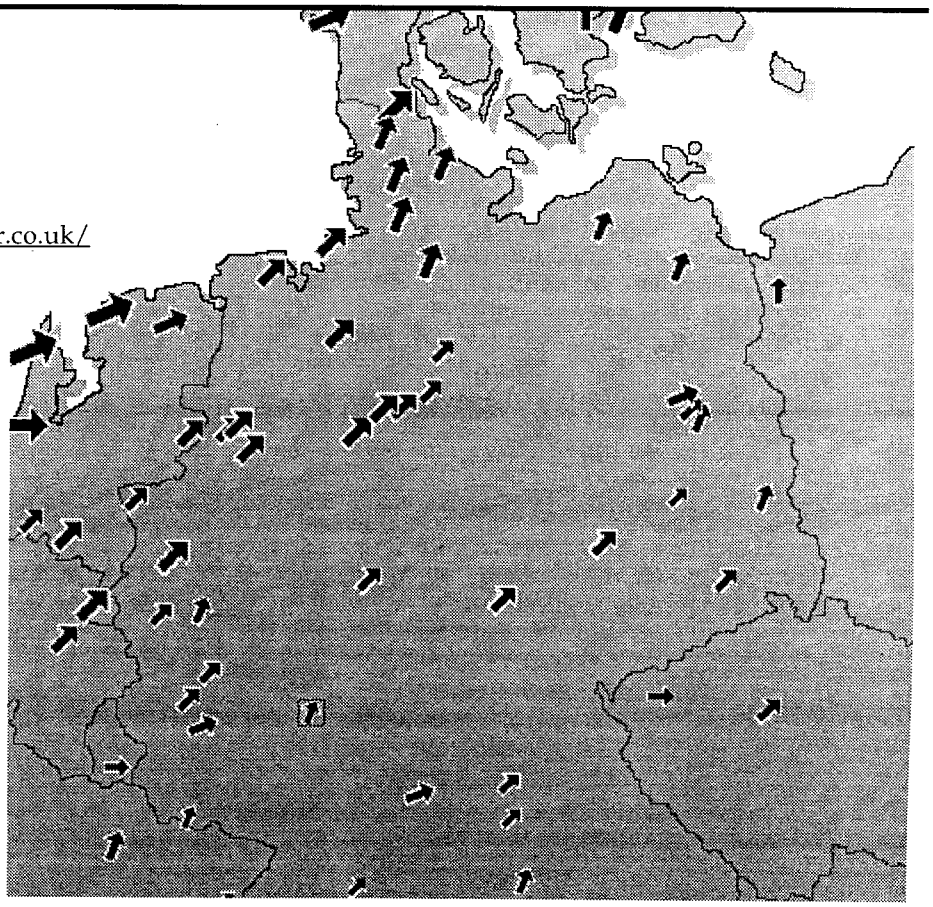
south or southwest is the most common wind direction. Disruptions in that direction are caused by distortions of the jet stream and by high and low pressure areas. The jet stream is less of a factor in the summer since it stays in Canada much of the time[1].

The arrival of high or low-pressure systems causes more dramatic wind direction changes. The wind rotates in different directions around these systems. In the northern hemisphere, winds rotate clockwise around a high-pressure weather system and counter-clockwise

XC Weather

GB FR DE Direction Strength Pressure
Temp Anim Data Prefs Email

http://www.xcweather.co.uk/



Frankfurt / M-Flughafen
Do 02:20 CEST

Wind Speed	4 kt
Direction	SSW
Temp / Dew	13 / 11 C
Altimeter	1016 mb
Visibility	>10000 m
Weather	

Cloud

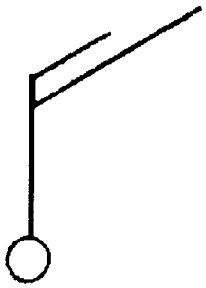
Few at 4000 ft
Scattered at 10000 ft

around a low-pressure weather system[2]. Therefore, you can anticipate that as a high-pressure system approaches, the wind will be out of the north or east as the system approaches from the north.

Surface wind direction can be estimated by looking at the isobar lines on a weather map. Isobars are lines that connect points of equal pressure on a weather map[3]. If you face a pressure isobar with your left hand toward the low-pressure area, the wind will be blowing in the direction you are facing[4].

Wind Strength and Reading Charts:

The distance between the isobar lines on a weather map shows the pressure gradient between different areas[5]. The closer the spacing of those isobars, the higher the wind speed. Fortunately, we don't have to compute the wind speed and direction using models like the U.S. Weather Service does. Weather maps from the TV and Internet show wind speed information. In previous articles we used Unisys upper air weather information for the Skew-T plots for lapse rate. In the Skew-T plot, the wind speed and direction by altitude was also plotted. In the context of this article, we are only interested in the ground level wind direction and speed. The symbols on those plots look like flags sticking out of little circles or + signs. They remind me of a flag stuck in the hole of a putting green on a golf course. Each long flag is equal to 10 mph of wind speed. A short flag is worth 5 mph of wind speed. The direction of the flagstaff is the wind direction (wind direction is from the flag end to the + end.) A staff going straight up would indicate a wind out of the north and one at 9:00 o'clock would indicate a wind out of the west. In the illustration, the marker shows a 15 mph wind out of the south.



For those who are only interested in wind, the Internet can provide more direct and useful wind speed and wind direction maps. Useful ones that I have found include:

http://www.agriculture.com/agweather/maps/windsp.html
This shows a color-keyed map of areas of wind speed with arrows showing the direction.

http://weather.unisys.com/surface/sfc_stream.html
This shows a more complete pattern of arrows color keyed to wind speed.

http://www.xcweather.co.uk/
This site is for Paragliders in the UK, France and Germany. One can click on a particular airport site and get wind information and much more.

1 Aviation Weather, DOT and DOC, Washington, DC, Reprinted by ASA Publications

2 Aviation Weather, DOT and DOC, Washington, DC, Reprinted by ASA Publications, pg 35

3 Pagen, Understanding The Sky, pg 75, Published by Dennis Pagen, Box 101, Mingoville, PA 16856

4 Aviation Weather, DOT and DOC, Washington, DC, Reprinted by ASA Publications, pg 35.

5 Ibid, pg 35.

■

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

SCHEDULE OF SPECIAL EVENTS

July 28-29, 2001
Rosebowl Soaring Festival Pasadena, CA
Richard Burns, (626) 857-0024

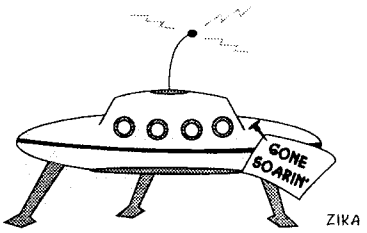
August 11-12, 2001
Pacific Northwest HL Regional Redmond, WA
SASS R/C HLG
Adam Weston, (206) 766-9804
red@tgworks.com
http://www.reddata.com/SASS

August 11-12, 2001
CRRC Soar-In Contest Sudbury, MA
http://www.charlesriverrc.org
Dave Walter, (978) 562-5400
dwalter@ultranet.com
John Nilsson, (978) 368-7136
nilssonj@rd.simplexnet.com

September 1-2, 2001
Tangerine Soaring Championships Orlando, FL
www.orlandobuzzards.org

September 14-16, 2001
Last Fling of Summer Broken Arrow, OK
Dave Register, regdave@aol.com

September 28-29, 2001
Oc-Tow-Berfest 2001 St. Louis, MO
Peter George, (314) 664-6613
twometer@worldnet.att.net



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.

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For Sale - Business

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

FENDERS! Cover your aileron and flap pushrods with a set of fenders, to help protect bottom of wings & control horns. Price (check or money order): $5.95 (set of 4) + $3.50 S&H USA. (Texas residents add 7.250% sales tax.) Viking Models, U.S.A., 2 Broadmoor Way, Wylie, TX 75098; (972) 442-3910.

DesignAire: EASY TO USE AIRCRAFT DESIGN SOFTWARE (PC). 3-D sketch, performance, Wt/Bal, inertias, color graphs, panel analysis, static stability, airfoils, FAR 23A loads and envelope. Runs "airfoil ii". $119. JammAero POBox 69, Wallops Island VA 23395. www.jammaero.com.

BUZZ WALTZ R/C DESIGNS: Kits & plans. www.buzzwaltzrc.com or phone: 760-327-1775.

For Sale - Personal

RnR XBSC cross country ship with low milage. Install receiver, trim and fly. Includes 6 Airtronics servos and battery pack, plus original RnR shipping case. $550 UPS COD. Bob Sowder, Memphis, TN, 901.751.7252 eve., or e-mail <bsowder@wmctv.com>.

Father retiring from sport and my wife will kill me if I don't clean up my shop. Built models are outstanding craftsmanship and in mint condition. Price listed or P.O., plus shipping cost. Sagitta 900 built with spoilers and Futaba radio... $300.00. Pulsar 100" w/S3021 w/5 servos... $300.00. Gentle Lady w/Futaba radio... $200.00. Windspiel Kestrel 19 kit in box, glass fuse., 134.5"... $200.00. Electra kit in box w/elec. motor... $60. John, (860) 651-9126, Connecticut.

KITS N.I.B. + UPS

Multiplex Cortina	$350
Multiplex Alpina C.S.	$400
Multiplex Condor	$950
Multiplex Flamingo	$100
Roke SB-10	$600
CHK Kauz	$325
CHK Flipper	$375
CHK Crystal	$375
Brillant V-Tail	$275
Groco Duration Modi	$275
SIG Obsission	$250
Paramount	$175
Robinhood 99	$225

Craig Christensen, (952) 435-7406, after 4:30pm CDT, MN.

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

http://www.silentflight.org

Sailplane Homebuilders Association (SHA)

A Division of the Soaring Society of America

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

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

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

The Vintage Sailplane Association

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

Vintage Sailplane Association
1709 Baron Court
Daytona, FL 32124 USA

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

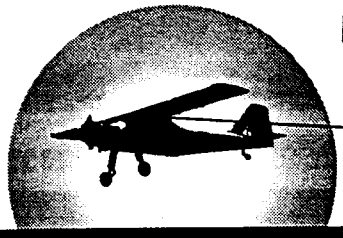
AMA Sanctioned soaring competitions provide the basis for ESL contests. Further guidelines are continuously developed and applied in a drive to achieve the highest quality competitions possible.

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

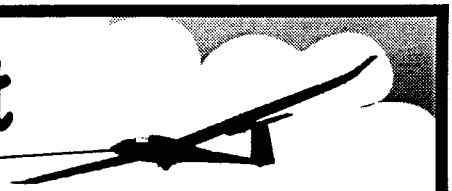
Continuing with the 20+ year tradition of extremely enjoyable flying, the 1999 season will include 14 weekend competitions in HLG, 2-M, F3J, F3B, and Unlimited soaring events. Come on out and try the ESL, make some new friends and enjoy camaraderie that can only be found amongst R/C Soaring enthusiasts!

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

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



The Great Midwest Oc-Tow-Berfest



2001

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Field open to early arrivals on Thursday.

$20 Entry Fee / Towpilots Free

Event Coordinator Peter George

Ph. 314 664 6613

twometer@worldnet.att.net

Flying begins after 9AM pilots meeting.