R/C Soaring DIGEST

October, 1995
Vol. 12, No. 10

U.S.A. $2.50

A Publication for the R/C Sailplane Enthusiast!

R/C SOARING DIGEST

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The cover photograph is our first digital photograph submission, and was sent in by Kevin Fotorny of Huntsville, Texas.

THE TEXAS NATIONALS
UVALDE, TEXAS

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[Material may be submitted via 3.5" Disk (MAC or IBM compatible), and is most appreciated!]

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R/C Soaring Digest is printed on recycled paper.

The Soaring Site

Digital Photography

We have received some beautiful digital photography this month. The cover shot was received first. Thanks, Kevin. Since this is a first, we're back into the books, reading and learning about photographs. We hope that we do the photos justice.

The second set of beautiful digital photos included in this issue were submitted by Tom Feldvebel of Aptos, California with the article entitled "Blanco or Bust: A Slope Story". He used a Kodak DCS 200. Thanks, Tom.

There were two more sets of photographs submitted on disk this month, as well! Thanks go to John Derstine of Gillett, Pennsylvania and Gene Cope of Union Gap, Washington. While their photos are not included in this issue, we plan to include them next month Thanks, guys.

Digital photography and photographs on disk can be a neat way to go, particularly for those of us that have to fake a multitude of photos every month. Let's say, "It's midnight in the 11th hour, and it's snowing outside. A coyote can be heard complaining off in the distance, and the usually complacent cats keep staring at the door, hair raised along the back on one, a bushy agitated tail beating the carpet by the other. Who in their right mind would go out on a night like this just to get a photograph of that special doodad to complete that last article, so that you folks would be happy?" What should we do? Simply, snap the photo, plug the camera into the computer port, and move the icons onto the disk. Of course, sigh, that's probably when the power mysteriously goes out...

What we're trying to say, is that the best way to submit photographs is whatever is best and easiest for each of you. And now, "Thanks!" We really hope that all of the photographs look good this month.

Happy Flying!
Jerry & Judy Slates

STOP PRESS!!!

NEW ENGLAND R/C SOARING CONVENTION '95
November 18, 1995

The DownEast Soaring Club is pleased to announce the second New England R/C Soaring Convention. This special event will take place Saturday, November 18th at the Sheraton Tara Hotel, Portland, Maine. The cost for this one day event is just $20, which includes a luncheon buffet (guests can be invited). The day will conclude with the awarding of a door prize and raffle prizes donated by our sponsors. Don't forget to bring a plane, because on Sunday we'll get together for a full day of flying. Slope, thermal, or hand launch, we'll offer it all.

Flying will also be available on Friday, **November 17th**, for those of you that arrive early. **Call Carl Trottier at (207) 284-8685.** Upon request, site maps will be mailed out in advance.

We believe our choice of speakers will satisfy most everyone's interest.

- Bill Kuhlman, Flying Wings
- David Garwood, Intermediate Slope Soaring and Racing
- Pat Flynn, Cross Country Soaring
- Mike Lachowski, So You Want To Be A Thermal Wizard?
- Ed Slegers, Electric Gliders
- Jerry Slates, R/C Scale Construction, Then and Now
- Tim Renaud, Airtronics - Tim will introduce the new Stylus radio, which is the Vision replacement, servo applications, types and nomenclature. At the end of his discussion, the Stylus will be raffled off.
- Larry Sribnick (tentative - at the Evening Social), NICAD Batteries, Proper Care and Feeding

This event is co-sponsored by: DownEast Soaring Club, Airtronics, Inc., Aerospace Composite Products, B² Streamlines, California Soaring Products, Major Hobby, *R/C Soaring Digest*, Slegers International, SR Batteries, Inc., The Birdworks, and Viking Models, U.S.A.

Come join us for this special event. Portland is only 2 hours from Boston and 20 minutes away from Freeport, Maine. Freeport is the home of over 121 discount shopping outlets, including the famous L.L. Bean. The Maine Mall, across the street from the Sheraton is fully enclosed and offers 134 stores and outlets. So why not bring a friend and do some Christmas Shopping. **An information packet can be forwarded upon request.**

Special room rates are offered by the Sheraton Tara Hotel, (207) 775-6161. In order to receive this **special room rate**, you must **make your reservation by October 28, 1995**, and you must mention that you are attending the "New England R/C Soaring Convention". Additionally, the Day's Inn is a three minute walk away, and their number is (207) 772-3450.

Convention reservations are required by November 6th. In addition to the information packet mentioned above, a **Convention Program** has been prepared and will be provided to all registrants. It contains detailed information about the speakers, the flying sights (what to fly, and what not to fly), the agenda, etc. If you do not get your copy in advance, just remember that the Convention is being held in Lighthouse Ballroom A, and it starts at 8:00 A.M.! ■

NEW ENGLAND R/C SOARING CONVENTION
REGISTRATION FORM
November 18, 1995

Name: _____ Tel.: _____
Street: _____
City: _____ State: _____ Zip: _____
Convention Fee (includes Luncheon Buffet) # ____ x $20 = _____
Luncheon Buffet for Guest (No Seminar) # ____ x $15 = _____
Total _____

( ) Please check here if requesting information packet.

Please make check or money order payable to "DownEast Soaring Club". Send registration form and payment to:

James T. Armstrong III
RR #1 Box 27
Topsham, ME 04086
Phone (207) 725-5759

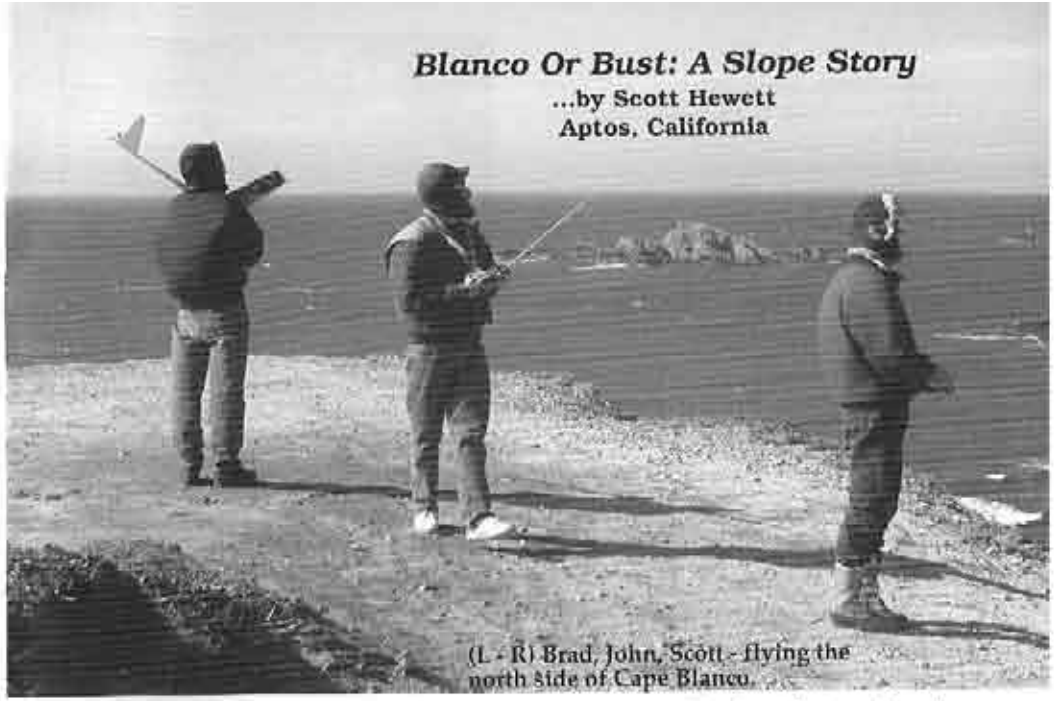
TOTAL FEE MUST BE RECEIVED BEFORE NOVEMBER 6, 1995.

For additional information, please contact:

Steve Savoie
RR #3 Box 569
Gorham, ME 04038
Phone (207) 929-6639

Blanco Or Bust: A Slope Story

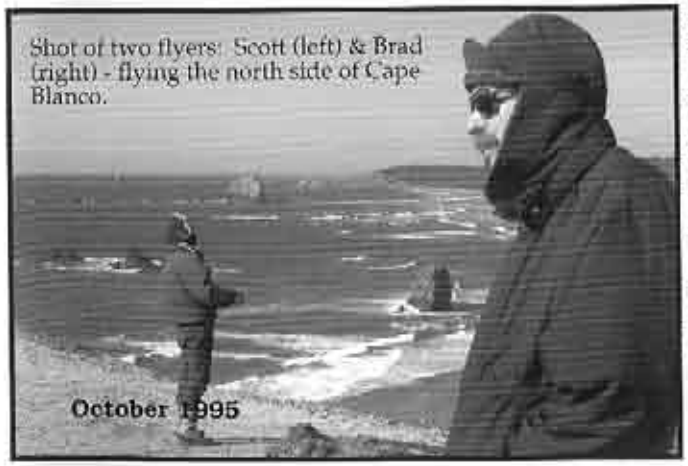
...by Scott Hewett
Aptos, California



(L - R) Brad, John, Scott - flying the north side of Cape Blanco.

What began as a casual conversation about flying sites in the fall of 1994, culminated in an unforgettable adventure for five of us "wind junkies" who usually fly at Sunset State Beach near Santa Cruz, California. I travel extensively and often return to relate tales of other slopes and winds to my friends at Sunset. Their interest became seriously aroused when I returned from Oregon with a video tape of a few flights at Cape Blanco and Cape Sebastian on the southern Oregon coast.

Our planning began during our regular Wednesday evening meetings where we cut cores, bag wings, and sample home-brews. The five "furious flyers" consist of Tim Stover, John Horning, Tom Feldvebel, Brad Grim, and Scott Hewett. It was decided that John, Tom and Scott would head North in Tom's bus conversion one day earlier than Tim and Brad, who would be driving a new 1995 Ford Windstar Van. Tom's 35' 1954 bus conversion provided the ultimate in living and hanger services. The GM PD4104 bus model was the workhorse for Greyhound and Trailways Bus Lines at one time. Now, after 2,500 hours of Tom's labor, it is fully "tricked out" with everything from a dishwasher to headset walkie-talkies for on-the-road communications. Our complement of gliders and radio gear in the hanger room was a full quiver, indeed. We departed with 27 gliders, 10 extra wings, 14 transmitters, and 23 receivers. There were floaters, many and varied medium wind planes, and of course, the big guns: the slope rockets for which ballast is actually weighed by the



Shot of two flyers: Scott (left) & Brad (right) - flying the north side of Cape Blanco.

pound. Many modified and/or scratch built R&D designs were put to the test. The following is a chronological order of the trip.

Friday, May 5, 1995

The bus departed Santa Cruz with Tom driving. We regretfully missed the Los Banos Scale event, but with limited time on our hands, we opted for the big slopes and winds of the North Coast. We were soon rewarded. After only two hours, we decided to take a brief flying break at the historic slope just south of San Francisco called Fort Funston. The wind was 40+ mph, and no one was flying! The author quickly grabbed his John Higgin's built, highly modified *Rodent* with an un-ballasted wing loading of 31 oz. per square ft., and tossed off. The *Rodent* was truly in its element, going vertical as few other planes can. After a couple of rock & roll flights, we decided to get the bus rolling before the commute traffic caught us. What happened next was

1954 diesel coach converted to a motor home.

The author makes adjustments to his *Rodent*.

an indicator of what would follow. Upon reaching mid-span of the Golden Gate Bridge, a wind gust of 60+ ripped a skylight off the top of the bus, sending it over the guardrail, and hopefully committing it to the depths. Either that, or there is a Matson Lines freighter with a new skylight! The drive north was a cool one with a four square foot hole in the top, and the night even colder as we slept alongside the Eel River, north of Garberville.

Saturday

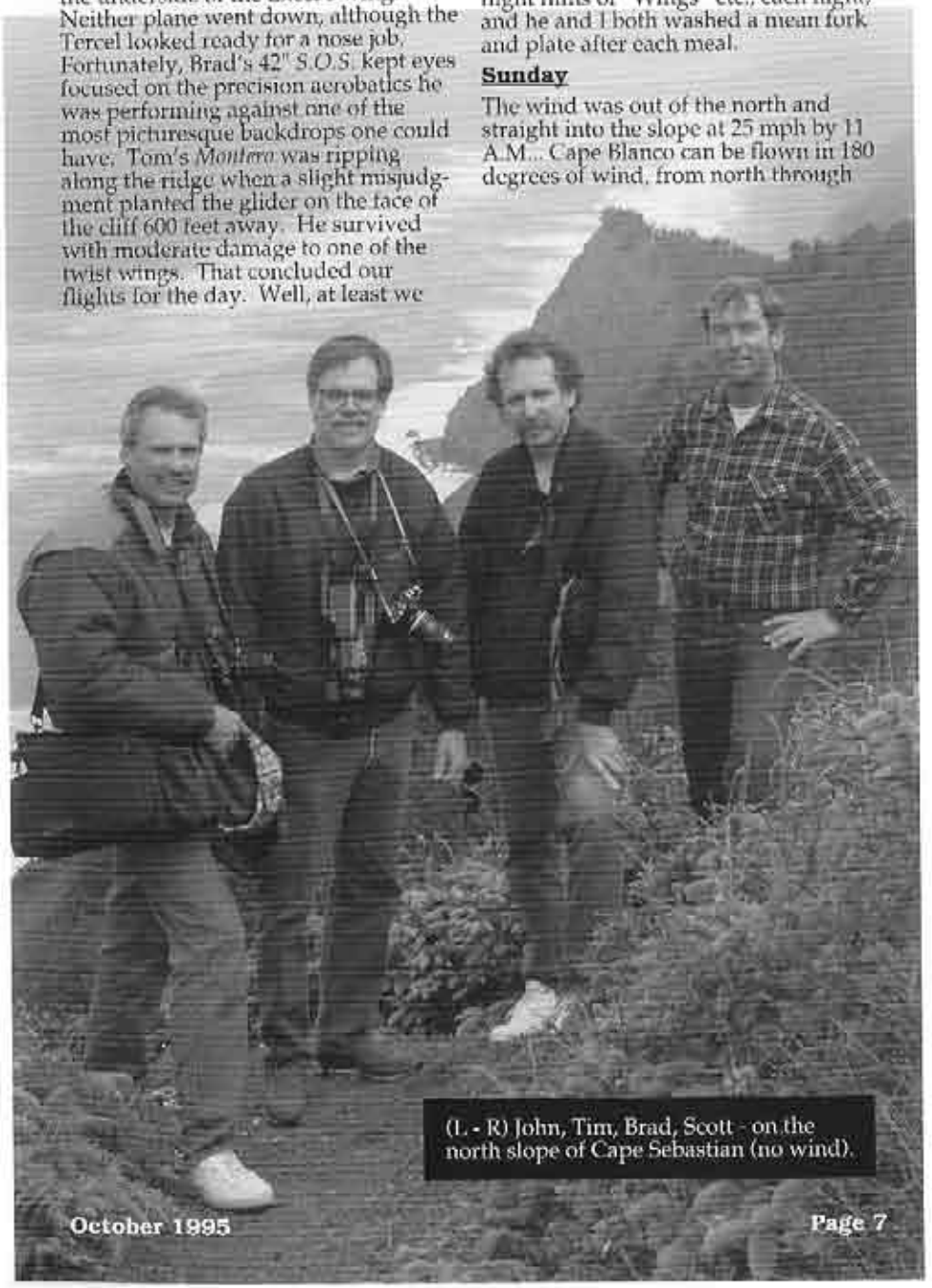
With rain threatening, we pulled into Eureka and did a temporary skylight repair at a building supply store, and were back on the road in 30 minutes. After 562 miles on the road, we pulled into Cape Blanco State Park, northwest of Port Orford, Oregon. An hour later, the Ford van arrived with Tim and Brad (our brewmaster). Were we glad to see them! We checked into Cape Blanco campground and were provided

with one of the most beautiful campsites imaginable, and only one half mile from the slope. The wind was only 18 mph when we arrived, just enough for a *Tercel* and *Mini-Excel* to tangle with one another. The *Tercel* lost all of its nose, depositing fragments in the underside of the Excel's wing. Neither plane went down, although the Tercel looked ready for a nose job. Fortunately, Brad's 42" *S.O.S.* kept eyes focused on the precision aerobatics he was performing against one of the most picturesque backdrops one could have. Tom's *Montero* was ripping along the ridge when a slight misjudgment planted the glider on the face of the cliff 600 feet away. He survived with moderate damage to one of the twist wings. That concluded our flights for the day. Well, at least we got all of our crashes out of the way that first afternoon.... NOT!

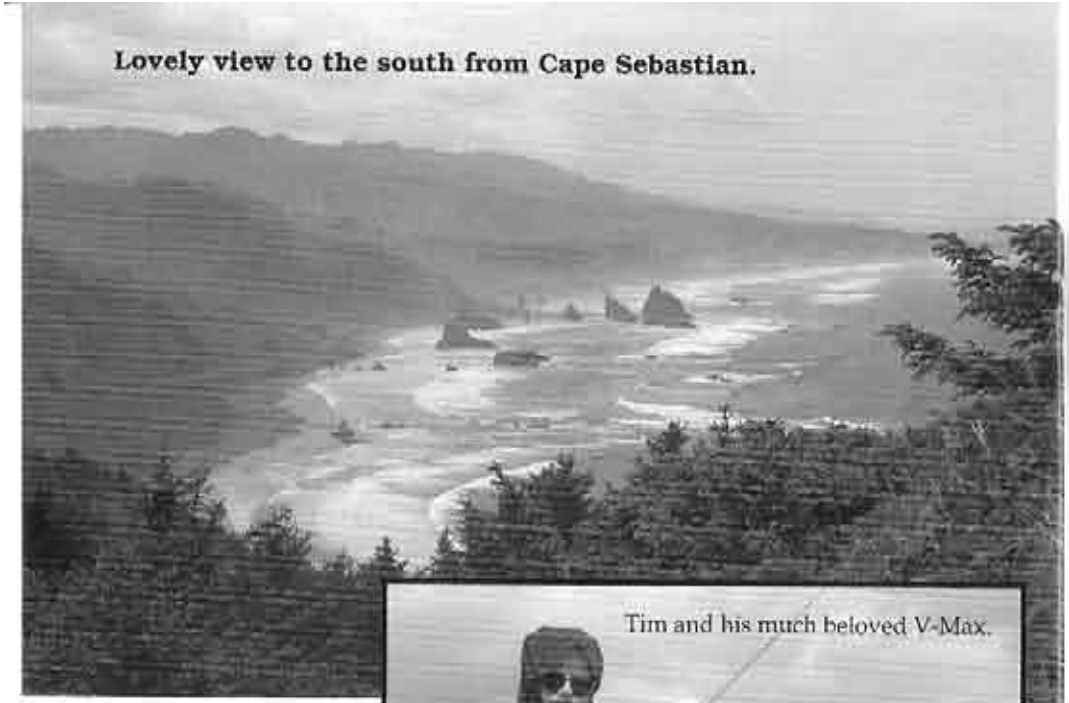
Our chef on the trip was John, who hones his skills cooking as a firefighter for the City of Menlo Park. He provided us with truly gourmet meals throughout the trip. Brad provided flight films of "Wings" etc., each night, and he and I both washed a mean fork and plate after each meal.

Sunday

The wind was out of the north and straight into the slope at 25 mph by 11 A.M... Cape Blanco can be flown in 180 degrees of wind, from north through



(L - R) John, Tim, Brad, Scott - on the north slope of Cape Sebastian (no wind).



Lovely view to the south from Cape Sebastian.

Tim and his much beloved V-Max.

west to south. The south and southwest are best, but those winds generally indicate a weather front moving in with rain likely. Our flying on the north slope this day was pure pleasure. The winds were just right for all kinds of maneuvers and planes (except the big guns). The P.D.A. (plane damage assessment) for the day: a few scratches here and there, and a slight fracture on Brad's twist wing *Kestrel*. Tim pointed out that John did not bring his new R&R *Nova* on the trip.. At the end of the trip we also noted it was the only glider he owned that did not require repair! (He must like fixing planes as much as he likes fixing dinners!) Still, the Cajun style BBQ chicken was great. During dinner someone reminded the author about a crash in his *Mini Excel* sustained earlier in the day, but since I never mess up, it must be assumed a "radio hit" occurred, right???

Monday

We awoke to a 180 degree shift in the wind and a fresh southerly breeze of 18 mph at sunrise. By mid-morning the velocity increased rapidly to 35-40, oh boy, here we go! The south slope at Blanco provides bigger lift and more punch than the northern side. Having flown both sides before, I knew we were in for a classic day if the rains held back. Never mind the typical kit planes, this was a day for the custom built "big guns"! All of us had our hot stuff loaded out and on the line. Tom and Brad build and prefer to fly a twist wing *Kestrel* designed by Tom. Today was a great day for R&D on their heavily loaded plane, with 25 oz. per sq. ft. on up. Each pass they made

Scott's *Rodent* makes a low pass against a gorgeous natural backdrop.

went higher and higher, until it seemed they were tearing holes in the cotton candy clouds. Tim and John were flying their *V-Max* custom ships. They both favor the Selig 7003 airfoil for all around ripping up the slopes. Tim also cuts and bags wings of various aspect ratios using the RG 15, HG 1.0-8, and S7037, all of which fly extremely well. Once again, the author threw off his *Rodent* with 45" wings loaded to 40+ oz. per sq. ft. Blanco took it all and begged for more. The author's favorite vertical maneuver is called "In Yer Face, Over the Top, Sit and Spin", and is particularly suited to the *Rodent's* abilities. This dramatic maneuver consists of a downwind dive from high altitude to a sudden pullout "in the face" of and atop the pilot, numerous axial rolls accompany the resulting vertical climb and continue as it "sits" and tailslides back "in yer face" again with an eye level inverted pullout. Tom brought out his power slope scale P-51 Mustang and dazzled the on-lookers with some life-like flights. Brad joined in after a few minutes and gave us some great video of a dogfight and some formation footage. The day's P.D.A. was fairly typical for high winds and as many flights as we had: wingbolts, servo arms, dinged wings, etc. While landing his *V-Max*, Tim shattered a wing rod; you could hear the "clink" a hundred yards away. One of the noisiest "forced landings" was John's *V-Max* skidding across a gravel parking lot. He deposited red lacquer paint chips and a few tears all over the hill. Late in the day, an Oregon State Parks superintendent, coincidentally named Mike Hewitt, arrived alongside our group. We thought we were in for the "third degree", until he reached into the back of his car and grabbed his Birdworks' *Rubber Duck*. He checked frequencies, then threw it unmercifully into the stiff 35+ wind. It is rare to find a park official with as much skill and enthusiasm towards the sport as Mike has. Surely a great example and ally to have on "our side". Our group of five flyers was a small unorganized gathering. **Large events should be cleared with the proper authorities if you intend to fly at a public facility, as there are safety, sanitation and other considerations that need to be addressed beforehand.** With our flying concluded for the day we headed back to camp for dinner. Another bit of advise here: if your chef flies planes, never mention "a Cuban Eight"... John mistook it for " a Cuban ate" and shorted us one steak at dinner that night. After dinner we decided to try flying a *Rubber Duck* at dark. I have done it before and it's lots of fun; not this time though, as it was the only plane lost on the trip. Steve Hinderks from The Birdworks says he gets more Ducks returned that way. (Steve found my Duck ten days later and mailed me

the salvageable parts.) That night, Tim, our resident electronics wizard, helped us tweak our battery systems for better performance. The technical aspect of charging, etc., are beyond me, I'll tell ya. I thought Chargers were from San Diego. Knowhatimean?

Tuesday

Southerly wind again! 7A.M. shows us 25 mph increasing steadily until we had solid 40's, gusting over 50 from 1 to 6 P.M. Brief periods of drizzle would pepper the pilots. Flying the Oregon coast requires extraordinary clothing gear. I have tried using duct tape to keep Navy watchcaps on my head, and they still get blown off. Gloves are necessary if you plan on flying for extended periods. We were just launching the "heavies" again, when our old friend Steve Hinderks of "The Birdworks" arrived. He had just returned from the Los Banos Scale event where his huge *Albatross* won the Pilot's Choice award. Many of you know Steve and Paulette from the Birdworks and their *Rubber Duck*, *R.C. Gull*, the *Geek*, and the new *Zipper*, etc. We know Steve from Sunset Beach where he flew for years before moving to Oregon. We understand why they moved... Cape Blanco is the finest R&D test site imaginable. A 4 mile ride from their house and they have the "wind tunnel" at their service, with no electric bill. The winds are infamous. Last year a semi-truck was blown over in town by 104 mph, and it was even windier out on the cape... These are what I call "big boy" winds! Steve wowed us with his new *Zipper* flying wing, which should now be available in the stores. He also flew his new pseudo-duck called the *Geek*. If you like flying the *Rubber Ducks*, you will definitely want to add this to your quiver. With a full-flying rudder, it makes flat spins easy to do and extremely maneuverable for combat, all with the forgiving foam construction. Steve shared some secrets on landing at Cape Blanco with southerly winds, and since he has a home-field advantage, the tips saved us many cartwheels. I tried the first landing, but didn't pull up hard enough on a 100 mph downwind and went down in a rotor. Fortunately, only one half of the *Rodent's* 18 inch nose stuck in the ground. I have found that with these heavy and fast planes it helps to have a nose like a pogo stick. Some of my buddies actually call the *Rodent* a "Lawn Dart". We videotaped most planes in flight, when we could keep the camera focused on them... It was Rock 'n' Roll continuously. The videotape came in handy in locating John's *Hijacker* which also went down in a rotor. Even with the videotape it took four guys twenty minutes to find the plane. Later that evening, when the wind settled down, the author's *Mini-Excel* must have taken yet another radio hit, thrusting it headfirst into a tree below our campsite. Most of the plane was on the ground, but I had to climb fifteen feet up a tree to get the nose and battery pack! Later that evening, I kept the hanger room door closed, so the others could not get any "evidence photographs". After a shrimp scampi dinner aboard the bus, we were treated to a tour of Steve Hinderks' Birdworks. This was an honor, and truly a highlight of our trip. Steve does not open up his facilities to the public, for obvious reasons. Seeing past and present projects, along with hundreds of gliders ready to be shipped was impressive. It was rewarding to get an insider's view of a man, his machines, and a life in love with the slopes. His commitment and contributions to the sport were more obvious than ever after the tour. We left The Birdworks and returned to our campsite, where our garbage had attracted a most unwelcome visitor, and added a whole new meaning to the term "skunk works". Nuf-said!

Wednesday 7A.M.

No wind, some drizzle, and rain was forecasted, so we headed south. An hour later, we arrived at Cape Sebastian, a 750' high, bowl-shaped slope protruding out into the torrential winds about 35 miles north of the California border. (Think of it as an inverted avalanche chute... for the wind.) This happens to be my favorite site for all out ballistic flight.. If you are into extremes, this is it! If you are going to fly this place, ballast your plane, your transmitter, and your jock strap! In big winds, you will need it.

Take a good long look at your glider before you launch; you may never see it again. I've been fortunate there, or maybe Sebastian has let me get away with a few awesome flights. I have flown there when 50 oz./sq. ft.+ wing loading would not be unreasonable. (Landing would be another matter.) Our visit this day was a teaser, since we could not fly. My four buddies will be dreaming about this place until we head north again. I've always loved pushing the envelope with the big winds, and never walked away from a howling slope without flying it, but Cape Sebastian put me to the test last year. I launched the *Rodent* in a 65+ wind, and knelt down behind a hedge to fly. A couple of minutes later a squall came through with a conservative 75+ in it. After 5 more minutes, I said enough is enough, took the *Rodent* way down low, and traversed the hill going knife-edge to knife-edge to bleed off speed. That is the only time I have ever seen a glider gain altitude during continuous knife-edge orientation. I simply could not bleed off enough energy. I purposely stuffed it into the brush with no damage and went away shaking my head with a sheepish grin on my face... Thanks for another one, Sebastian! Anyway, our bus left Cape Sebastian and arrived at Cape Ferrelo, just north of Brookings. The wind was dying, so we limited our flying to twenty minutes with the *Monarch*, *Slupeithing*, a nose-less *Tercel*, and a 50" *S.O.S.* Somehow, John managed an inverted landing, and the fuselage of his *S.O.S.* was "skewered" by a twig. We departed Oregon and pulled into Trinidad, California for the night. Dinner was cooked by John and Tim: BBQ Hallbut, clam linguini w/pesto sauce, and asparagus.

Thursday

We continued our trip south, and pulled into Westport-Union Landing Campground north of Ft. Bragg. We flew some local bluffs, 80' in height at best. They were not exactly exciting, but still flyable. John's nose-less *Tercel* was not through being abused, yet. Somehow it rolled over in flight and regressed to an amphibian status, with salt water lapping at its fuselage and wings. A quick sprint by John, and a dousing in distilled water and alcohol, saved the radio gear. An hour later found us 2 miles south, flying some virgin territory. We were flying a cliff below the highway, and would cross over the highway and catch the lift off of a hill above the road. All was fine until Tom stalled the *Montero* and it crashed right in the middle of the southbound lane. Since I was closer to the *Montero* than Tom, I scrambled up the embankment quick enough to see a 3/4 ton pickup round the corner and run directly over it. Miraculously, only one wing tip was slightly compressed, not even tearing the Monokote. I will never forget the look in the driver's eyes when he came around the corner and saw the bright pink glider in his lane. I'm sure the 'ol boys at the mill are still hearing about it! Once again, the hanger room had two customers that night. We gave John a break and ate at a pizza place in Ft. Bragg that night.

Friday, May 12, 1995

With more rain and lousy wind forecasts, we headed home. Even as we headed south, we began laying plans for next year. In the meantime, I'll be working up that way again, and will tease my buddies with more video from "The Three Capes of Southern Oregon".

Our trip logged 562 miles north, and 624 miles south along the coast route. If you are planning a trip to Cape Blanco and have questions, feel free to contact me at: Scott Hewett, PO Box 935, Aptos, CA 95001-0935; (408) 688-7420. ■

This article was sent in by Tom Feldvebel of Aptos, California, who says he was responsible "to edit the written article, document the trip using a Kodak DCS 200 digital camera, and to compile the photos and article in digital format. John Horning and Scott Hewett also contributed photos." ED.

■

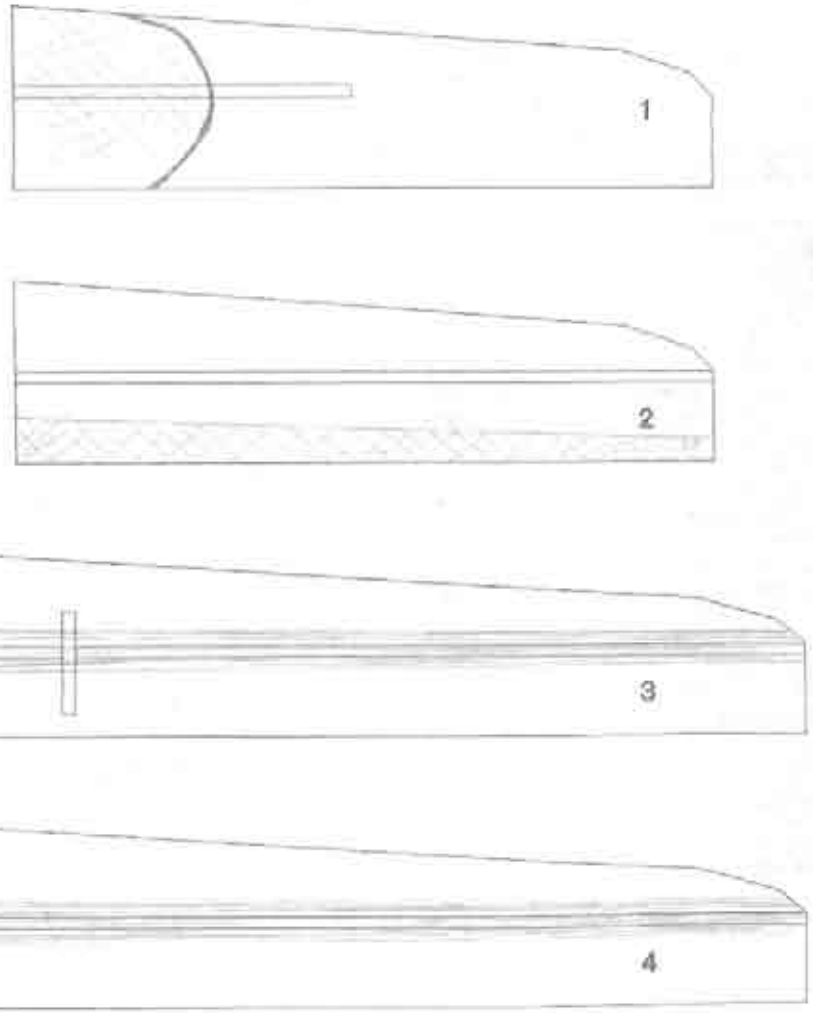
Wing Construction

...by Steve Savoie
RR#3 Box 569
Gorham, Maine 04038

I've often wanted to have a wing construction reference guide so that I can construct wings to a known or accepted standard, but some things is life just can't be had. Several months ago I made at least $30 worth of calls to the midwest and west coast to get recommendations for the lay up of glass wings for a Nimbus II. This proved to be an expense, especially when my better half reminded me that the money could have been used for purchasing servos, etc. She was right.

The wing lay up for my Nimbus wing panels (7.5" x 79" x 2.75") is still not yet on the drawing board, but this whole evolution made me realize how little we circulate such information between each other. So let me offer a couple of different wing lay ups that I and the DownEast Soaring Club have used over the years. All wings were glass bagged over blue foam insulation foam board which is readily available on the east coast.

WING CONSTRUCTION METHODS



WING 1

This wing was used with SD6060 and SD3021 airfoils for 12 Club planes. These 2 meter wings were designed for light lift slope and gentle winch launching. Each wing panel was fitted with an 18" full depth balsa spar. The leading edges were cut directly into the foam and were reinforced with a 2" strip of Spectra. Two layers of 1.4 oz. glass covered the entire panel with a third layer near the center one third. A stout glass bandage was used to attach the two wing halves together. The trailing edge was reinforced with a full length strip of .007" x 1/2" carbon fiber tape. This wing was quite light when finished which allowed the plane to slope quite well and to stay right up with a Chuperosa. Its fault was a stress riser at the end of the spar, especially during those wing tip landings.

WING 2

This wing was a replacement to wing #1. It sported an RG-15 airfoil and had the same leading edge technique. I now use Spectra over foam for all my leading edges. It's nearly impossible to sand through 1.4 oz Spectra leading edges which cuts down on construction time. The core on this wing had a 3/8" by 1/8" slot (top and bottom), recessed full length into the core via a full size router table and a sharp bit. The lay up was one layer of 4 oz. glass, top and bottom, and a 4" to 2" full length strip for extra measure to reinforce the full length aileron. The two panels were assembled together with a 3" and 5" wide strip of 4 oz. glass in the center. This wing is heavier than the original, but is much more crash resistant,; it appears to take moderate winch launches quite well. The wing was finished with the mylar paint transfer method. I used Krylon florescent paint with a white backer. This created too much paint and work, plus the florescent doesn't transfer as well as the regular Krylon. This ended up being a good, general purpose, slope wing.

WING 3

This wing was built for a Bob Sealy fuse that uses an RG-15 airfoil on a flat 100" span. The plane was built for slope and sport F3B. The root and sub-root were 1/4" plywood. A 1/8" x 3/8" full length spruce spar cap is fitted full length into the core and root/subroots. The recesses were cut with a router table. Two layers of 4 oz. glass, top and bottom, were used in the lay up. A 3" wide strip of unidirectional 2.9 oz. carbon fiber (top only) was used full length to strengthen the wing. To reinforce the servo wells, I used a 3" patch of 4 oz. glass. The leading edges were reinforced with a Spectra strip.

These wings use a 5/16" x 18" nitrite hardened wing rod. The root and sub root were drilled with a 5/16" bit and toughed with lots of thin CA; no tubes were fitted. These wings are quite heavy (17 oz. for each panel), but they are very strong and over strengthen at the outer 1/3 of their span. The amount of glass on the core negates the need for additional strengthening around the ailerons and trailing edges. The wings were finished with the Krylon mylar paint transfer method.

WING 4

The wing has the same lay up as wing #3, except the spar system is different. The same spar caps are used with a conventional box that's 8" deep with 1/16" plywood shear supports that have staggered 45 degree end cuts. This wing has taken some very hard launches though it's not expected to be quite as strong as wing #3 due to the wing rod attachment method.

WING 5

This 2 meter SD7037 wing panel has a 1/4" ply root and a 3/16" subroot. One layer of 3 oz. glass covers each outer surface with a partial layer of 4 oz. unidirectional S-glass beneath. The S-glass extends out 3/4 length on the top surface and about 5/8 length on the lower surface. Each panel with one servo weighs 11 oz. A 1/4" x 17" nitrite hardened wing rod secures the panels to a Pixy fuselage. So far, this wing has taken moderate launches quite well with no wing flex, which may be due to the greater stiffness afforded by the S-glass. The only thing I don't like about this wing is the tip areas past the

S-glass. With only one layer of 3 oz. glass, they are subject to finger dents. Krylon paint was used on the mylars to finish the wing.

WING 6

This 100 wing has a SD7037 airfoil and was bagged by my good friend Wayne Fredette for an old Sagitta. This wing had a cover layer of 2 oz. glass, with full length layer of 4 oz. unidirectional S-glass that was followed with a partial 3/4 length of 4 oz. unidirectional S-glass. A conventional root/sub-root system was used to tie in the wing rod on this wing. Wayne said that this wing takes very strong launches, and if you have ever used a Fredette Winch, you know what I mean.

Summary

I used Aerospace Composite Products cloth and carbon with WEST resin on most of these wings, and I purchased my wing rods exclusively from Soaring Stuff. I glue balsa tips on the foam cores, sand them to shape and then bag them into the wing.

It's taken me several years to become comfortable with glass bagging techniques, both with fabrication and cloth selection. I hope this article helps someone out there. Glass bagging has been quite popular now for several years. It's just too bad no one has come up with a reference guide for suggested lay outs based upon use. Any takers? ■

Editorial Note

Are You New to Sailplanes?

Well, then it is important to stress that, "Large events should **(always)** be cleared with the proper authorities if you intend to fly at a public facility, as there are safety, sanitation and other considerations that need to be addressed beforehand." For example, did you know that many states, such as Oregon, require that a permit be obtained for any activity?

Additionally, it is appropriate that all informal flying, whether it be a group of one, or a group of 10, should be cleared with the proper authorities or property owners, anywhere we fly. We want them to know that we're there, that we have the proper insurance, and that we are respectful of any restrictions that they may require of us. (This could include such things as, "Don't wave a red flag at the bull," or, "Don't fly over that stretch of water." (Who knows. It might be full of quicksand... Or, worse yet, it could be full of alligators, just looking for a tasty meal, which could become your favorite, hard earned plane...)

The smallest common courtesy or personal touch, as we all know, may insure that we'll have places to fly for many years to come. As Chuck Anderson said in the last issue, "The nicest people fly sailplanes. I like being around nice people."

Judy ■

All Roads Lead to Roke Modell

...by Robin Lehman
New York, New York

On a recent trip to Europe, I thought I would try out my Berlitz German, and see if I could visit with Roland Kern. As many of you know, he is the person behind Roke Modell.

Roland lives in a small town, which is 30 or so kilometers south of Frankfort. The directions he gave me were very simple. He said, "Drive towards Wannwell, and follow the yellow signs!"

Well, let me tell you! The Mayor in charge of Wannwell certainly has his priorties right! All the signs in the town lead to Roke Modell!

Roke Modell makes a number of four meter and larger sailplanes: ASW 19, ASW 17, SB 10, DG-202, and an ASK 18. If any of you are interested in one of these scale sailplanes, and it is not carried by us at Sailplanes Unlimited, we will be placing an order with Roke in the next few weeks. (We stock the ASK 18.) Delivery should be sometime in January, or earlier.

For more information, please contact me at (212) 879-1634.

■

Correction

There is a correction to the September issue of *RCSD*, page 38, "Rodel Modellbau 1/4 Scale ASK 21" written by Ron Wahl. The ASK 21 kit now comes complete with everything, including spoilers. Ron had an earlier kit version. ED. ■

Jer's Workbench

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Wings & Things

Last week, I received a copy of a new video from Soaring Stuff, "Building Hollow Composite Wings". This is a project that I have been wanting to do for years, but you know how that goes. But the video was the push that I needed, and hopefully I will start the project, soon.

This tape is very well done. Although I had the general idea of what to do, after watching the video, all my questions were answered. If you are interested in doing a hollow core, composite wing, then this 75 minute video may be for you. It covers everything, from the plug to making the mold, what to do after the mold is made, and suggested lay-up from spar to completed wing.

Last January, I shared with you my method for constructing a balsa/laminated carbon spar. I asked if any of you had a different method that you would like to share. The following method was sent in by a reader from Wyoming, Tony Upso.

Spar Design

1. Spar is interesting, but heavy and weak.

2. Only 1 carbon sheet is needed - the one nearest the bottom (tension). One on top in compression. Carbon fiber has no strength in compression.

3. Proof: You cut two carbon laminates for wing joiner, leaving only two to carry highest stress (i.e., at end of joiner). You also state the spar works. It does because of the single carbon laminate near lower surface, remembering that the upper one does nothing.

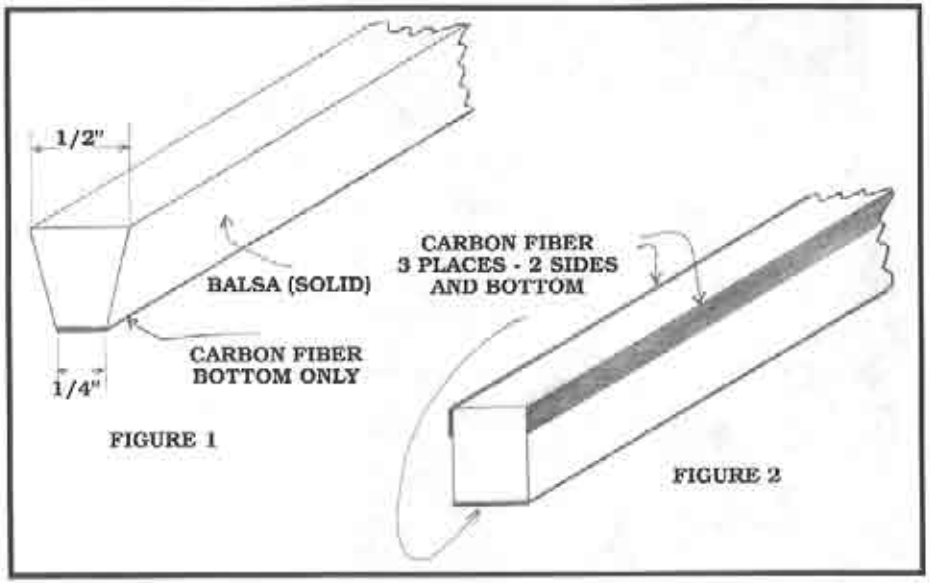
4. Most wing failures are compression buckling on top surface. So, better (lighter, stronger) cross section would be: *(See figure 1.)*

5. Alternate: *(See figure 2.)*

2 carbons on top/sides of spar prevent lateral buckling, the common cause of failure. One on bottom is like yours.

6. There is a problem with humid warping on both spars herein. Necessary to completely seal (water proof) spars while still straight.

Thanks, Tony. Does anyone else have a method for spar design? ■



on the Wing

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The Newest Stealth Fighter — A Candidate for P.S.S.?

Issue number 95 of the T.W.I.T.T. Newsletter (May 1994) featured a story on what is reported to be the newest stealth fighter, complete with 3-view plans!

The story came from the Associated Press, and was submitted to T.W.I.T.T. by Fred Blanton who found it in his local newspaper.

Jane's International Defense Review in March of 1994 published a drawing of an aircraft which had been several times seen in flight in the southwest, particularly around Groom Lake Air Force Base in Nevada. As is usual with such aircraft, the Air Force did not comment either positively or negatively about the existence of this unidentified plane. However, as there are at least two videotapes of this aircraft in flight, it would appear PSS fans have a new subject to model.

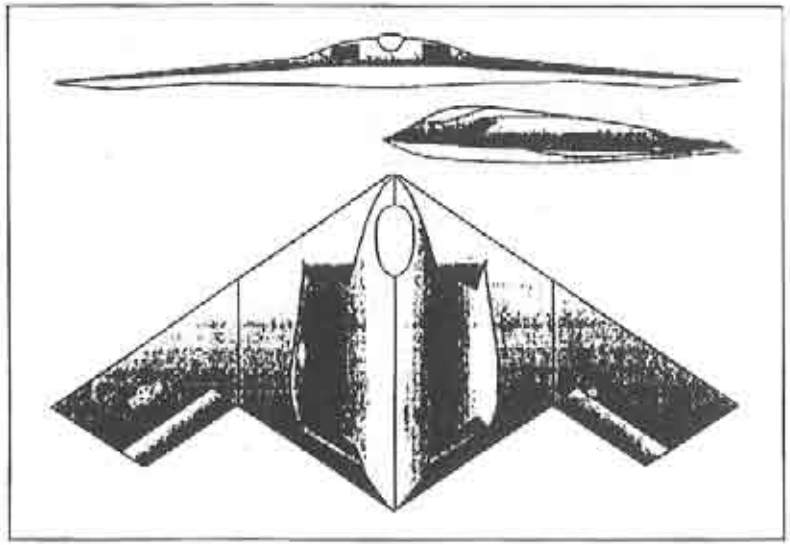
As can be seen from the accompanying 3-view, the new aircraft resembles the B-2 stealth bomber in many ways. The author of the report, Bill Sweetman, is a well known aviation writer. He believes it to be the successor to the F-117 stealth fighter, and superior to it in several ways: greater range, increased weapons capability, and even better stealth technology.

Clifford Beal, the Journal's features editor, viewed the videotapes and reports the plane flies at low to medium altitudes and appears to be capable of over 500 mph.

The fact that this newest stealth fighter has a lot of potential as a slope 'ship was of course left out of the AP news story.

Dimensions for the full size aircraft are not available at this time. We suggest making a model as large as possible while maintaining all dimensions directly proportional to the plans included here. When the dimensions of the original are available, the actual scale can then be computed.

We're always looking for ideas for future columns. Suggestions can be forwarded to us at P.O. Box 975, Olalla WA 98359-0975, or bsquared@halcyon.com. ■



SOARING EAST TO WEST

with
Bob Sowder
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Why an Entry Level Design Contest?

As most of you have read by now, *RCSD* is sponsoring an Entry Level Design contest. The response to date has been most encouraging. However, there are a number of veteran soaring enthusiasts who question the rules and design criteria. Many have even questioned the validity, or need for an entry level design.

Ladies and gentlemen, let us examine for the moment, the big picture. How do we continue to make the sport of RC grow and flourish? We start at the beginning - the BEGINNER. All too often, we so-called veterans overlook the lone individual who is trying to figure out the best setting for his monocoat iron, much less how to build and fly an RC model. I'm referring to the rank beginner who has an innate desire to fly a model sailplane and doesn't have much more than a clue of how to build and fly a model sailplane. This same individual is not yet connected to the array of available resources to guide him/her to the best possible decision process.

Having heard and read a number of comments from fellow sailplaners, there seems to be a good number of flyers who are looking for an intermediate design - something between a Gentle Lady and a full-house ship. I agree. A modestly priced sailplane that falls into this design realm needs some attention to development.

In my conversations and readings, the beginners design that is repeatedly mentioned is the Gentle Lady or its kin sister, the Sophisticated Lady. Both of these are wonderful, low-cost entry level sailplanes. My Gentle Lady is over 10 years old, and I still fly it in two meter competition. Those of us that take the time to correspond on the Internet, talk on the phone, or write articles, are current hobbyists at one level or another. We have either just built and flown our first sailplane or we have been involved for a period of time. We have a different perspective on our current needs for our next sailplane. We pay virtually no attention to the lone individual who is looking for their first sailplane. Typically, we know how to find resources to get answers. Beginners don't!

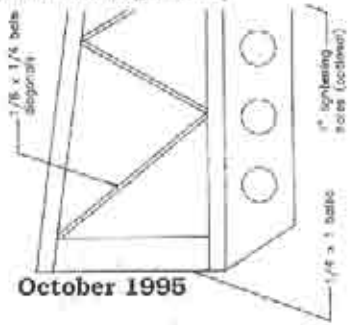
Now, let's consider the individual who has no resources, no contacts to speak of, and is looking for a beginners design. This individual is typically out of the "information loop". This is the potential enthusiast that, we as clubs, manufacturers, publishers, and advertisers should be trying to attract. From what I read and hear, this is the person who will purchase a Gentle Lady or similar entry level design. And let's face it, there isn't exactly an overwhelming selection to choose from. So, how about the prospect of offering to that individual some other valid ELD design alternatives? A low cost, buildable, flyable sailplane/radio combination.

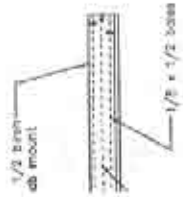
To keep our sport growing, this is the person that we, as established flyers, clubs and manufacturers need for continued growth. Ultimately, down the line, we all benefit. Think of it. Without an influx of new people into our cherished sport, those of us who continue will quite possibly become discouraged because of lack of participation and dwindling numbers. Folks, this is happening. We need the beginner!

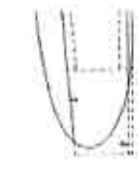
I suggest to you that any tool, equipment, radio, or model that can be developed for the beginner, thus helping to ensure his success at a reasonable cost, is quite possibly going to transform that individual into a long-term modeling enthusiast. That's the person we need to hook. And yes, we need to give attention to the intermediate pilot looking for his next design. For, he too, is important. But we must start somewhere, and I'm for helping the guy that needs help the most Anything less, in my opinion, is short sighted.

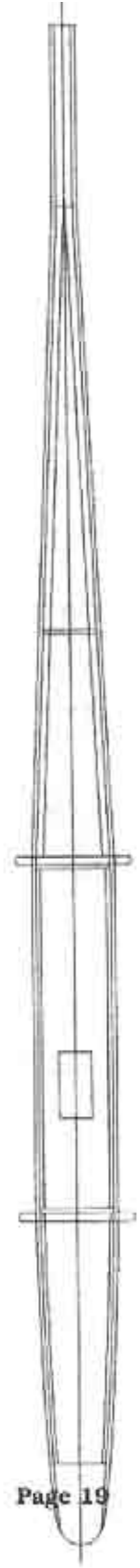
RCSD has shown, and will continue to show, a commitment to the beginner by stepping forward and promoting a concept that will be of benefit to the new enthusiast. This is a first step that will most assuredly yield some good, viable designs for fledgling pilots. And, who knows, perhaps in short order, there will be a design contest for intermediate sailplane designs. But for now, this is a solid step forward. So, let's start at the beginning - with the BEGINNER, and develop a new sailplane and an exciting new option for that beginner pilot to take to the sky and succeed! ■

Thanks, Bob! For those of you that are new to the pages of *RCSD*, the Entry Level Design (ELD) Contest announcement was included in the July issue of *RCSD* on pages 50 - 51. We said that we would keep everyone posted on any changes, and although the guidelines have not changed, there are two things to add this month. Bob Sowder has agreed to include any updates or pertinent information regarding the ELD through his column. All correspondence has been forwarded on to him, so feel free to give him a call if any of you need any additional clarification or if you have questions. The judging for the event will be at the 1996 Mid-South Championships in Memphis, Tennessee, June 20 - 23. The ELD is scheduled to follow Hand Launch on June 21. ED. ■









THREE PEAS IN A POD

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Curt: In August, SWSA (Silent Wings Soaring Association) hosted an SC^2 (Southern California Soaring Clubs) contest, which is usually a gathering of about 75 - 100 glider pilots representing assorted clubs from different locations throughout the Southern portion of the state. Shortly after the contest, the Internet was suddenly ablaze with colorful dialogue about a fairly prominent wing designer and manufacturer folding one on tow, as the gallery observed the model going slightly ballistic and nose-first into the roof of an adjacent commercial building. Well, that's true. I saw it, and was surprised that he seemed surprised about the outcome. While not exactly F3B-ish, it was a pretty hefty launch.

Our contest winches run 300 lb. Dacron on the bottom, 195 lb. on the top, in addition to about 100 plus feet of 150 lb. monofilament. The field is small and tight, so the lines are short and HOT, about 500 feet to the turnaround. There's absolutely no benefit to full-pedaling it. Usually, a traditional cambered launch transitioning to a bit of reflex just before reaching the apex will put you over the top and through a zoom, in good shape for the added "bonus kick" from the mono. In this case, you get more for less.

Every glider pilot, at one time or another, has witnessed wing failure on launch due to some form of internal fatigue, flutter, stress on components, or just a lack of overall structural integrity. Some wings de-lam, some set a permanent bend in the wing rod, and some will simply disintegrate. For the past several months, I've been flying a Prism fuse. with 7037 - 117" triple-tapered, glass bagged wings, designed by Ben Matsumoto.

Although I'm associated to California Soaring Products (Slegers International), these weren't "free-bees", and my only sponsorship is a pretty active Visa Gold card. Knowing that, I've continued to punish these wings in round after round of contest flying with no loss of performance and no unusual maintenance. As a matter of fact, I might have to slap one of those "NO FEAR" decals on a wing tip. Either way, you should contact Ben and see what you've been missing. Then, take it to the winch, stomp on the pedal... and amuse yourself!

A Conversation with Ben Matsumoto

Paul: What kind of foam do you use, and why?

Ben: I use Spyder foam. Mark Levoe (Super-V) advised me to use this type of foam. Spyder foam is the first extruded styrene foam developed for composite construction - better compressional strength, less finger dings.

Paul: What airfoils are available?

Ben: Airfoils most popular are the SD7037, followed by the S3021. I also use the RG-15, the S7012, the S7055, the SD8000, and the S4083. Any other airfoil from the CompuFoil program or Airfoil Plot 6.0 can be made.

Paul: What is the difference between double vs. triple wing planforms?

Ben: The most popular is a Shuman planform (triple taper). A double or a single taper should be used for high aspect wing planforms. You can get more wing area from a triple tapered section.

Paul: What type of wingrods do you use, and do they flex?

Ben: Hardened steel is used most of the time for less flex. Titanium rods give lots of flex when launching, but they are lighter. T-6 aluminum is light and strong, but gives a lot of flex.

Paul: How much do your wings weigh, with and without electronics?

Ben: The triple taper, 112 inch wing span, ready for servos, comes in at about 14 - 15 oz. on a 940 square inch wing planform, and 117 - 120 inch wing span comes in at 16 oz.

Paul: What colors are available?

Ben: Most of the time, I use white on the top, but other colors are available on request. I use Kryon paint.

Paul: Do you route out servo cut outs?

Ben: When I do wings, servo bays are routed out to your choice of servo.

Paul: How long is your turnaround time, and what is the cost of your wings?

Ben: It takes three to four weeks (excluding Saturdays and Sundays) on most wing spans. If I have to wire wings and install servos, it takes at least two more days. The cost for two meter is $250.00. The cost for 100 - 116 inch wing span is $300.00. Anything over a span of 116 inches, call Paul Ikona (California Soaring Products) or Ed Slegers (Slegers International) for a quote.

Paul: Will your wings flutter?

Ben: I have yet to flutter a wing. Fluttering usually results from poor linkage, slop in hinging, and sometimes poor construction. I use 3 oz. glass at a 45 degree angle to lessen tension.

Paul: Are flaps and ailerons cut out?

Ben: Flaps and ailerons are hinged, and the gap sealed. I use hinge tape and gap seals from the Airtronics Ad Line.

Paul: Are stabs and rudders available, and how much do they weigh?

Ben: Stabs, rudders, and T-tails are available upon request. The open class rudder weighs 1/4 oz. The open class stab weighs 1 1/2 oz. The open class T-tail weighs 2 1/2 - 3 oz.

Paul: Are you going to manufacturer any kits?

Ben: I am working on an intermediate polyhedral open class sailplane. It does not need a computer radio. The

wing, stab, and rudder are bagged. The fuselage is fiberglass and comes with servo tray, tow hook block, and front and rear bulkheads that are all made from plywood. The airfoil is S7055, span is 112 inches, area is 940 sq. in., and the weight is 68 oz. The functions are rudder, elevator, and flaps. The kit's name, for now, is "Ben Bird".

Paul: How do you wire your wings?

Ben: All my wings are wired in the trailing edge of the wing. I twist all my wires. It helps to lessen servo jitters from the transmitter.

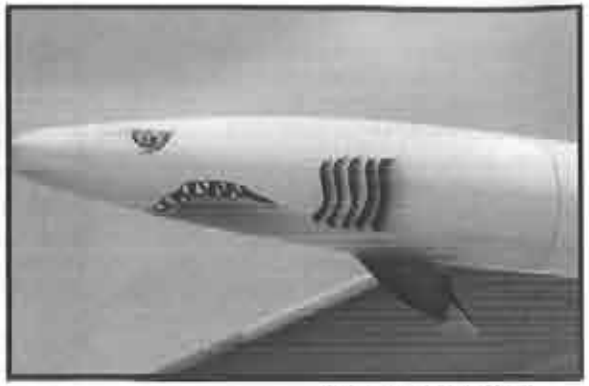
Paul: Are there any other added features that we should know about?

Ben: The bottom of the wings are painted black or blue, on request, after bagging chrome leading edge reflective is installed. I have had a lot of help

and information from Mark Levoe, Joe Wurts, Mike Ratner, Tim Renaud, and especially Paul Ikona.

Curt: Ben, I know that Joe Wurts uses a set of your 7037 on his Peregrine fuselage. How did that come about, and didn't you also make him a set of the 7012 for the same plane?

Ben: Tim Renaud, from Airtronics, contacted me through Mike Ratner to bag two wings for him, a SD7037 to be put on a Peregrine fuselage, and a S7012 for an Eagle fuselage. But, both wings were to fit both airplanes. Joe flies the Peregrine with the SD7037 airfoil. I think the 7012 wing may be collecting dust in some corner of the Airtronics building.



Rick Briggs MAKO.
Photo by Mike Deckman.

Curt: Tell us a little about your shop.

Ben: I work in a corner of a large building owned by Mike Ratner of Owen Mills. He is a sewing contractor for military and industrial items. Mike also stocks glider "goodies", some of which are carbon fiber, Spyder foam, 3/4 oz. glass, peel ply for bagging, mylar, winch line, and retriever line for us soaring pilots. Mike Ratner has helped me quite a bit.

I do all my work from one table. Shelves are over the table for bagged wings. A vacuum pump is nailed to the wall. I have access to a drill press, table saw, table sander, grinders, portable drills, and an air compressor.

Curt Why glass bagged wings over obechi or molded wings?

Ben: The molded wings are too expensive. I haven't done an obechi, yet. I do bagged wings: incredibly strong, but lightweight.

Bagged wings are basically finished out of the bag. They need trim cuts on the flaps and ailerons, servo bays are routed out, and wiring is done in order to be complete. There is more work in the obechi wings. You have to install leading edges, face flaps and ailerons, and finish the top and bottom of wing surfaces, as desired.

Curt: You have been experimenting with the 7055. What is that all about?

Ben: The 7055 airfoil was requested by Tim Renaud of Airtronics. My new intermediate sailplane used the 7055 airfoil. It flies well, slow like a Paragon, but will penetrate down wind or up wind, and not lose much altitude. It's the new age floater airfoil. The one thing I have found out is, if the wing is bagged vs. built-up, you do need flaps to slow you down on your approach.

P.S... At about this time, the phone rang, and Paul asked, "Mike? Where are you? You missed the interview. Papua? As in New Guinea? Doing what? Skin Diving? Nahhh, I didn't know that sharks knew how to fly..."

Until Next Month... "Boomers!"

"Wings by Matsumoto" are sold exclusively through California Soaring Products and Slegers International. ■

According to Paul, he has a Stylus now, which is the "replacement for the Vision", according to information that we have seen. If you have a Stylus, and need a bit of help with the programming, he says to give him a call. His address and phone number are at the top of this column. ED. ■

Gordon Jones, 214 Sunflower Drive, Garland, Texas 75041; (214) 271-5334

K9223 - Combination Airfoil

Over the past few years, my flying and building buddy, Dale King, and I have come to realize the particular aspects of an airfoil that we like and above all what works well for both of us. This has come after many, many trials and, of course, some failures along the way. But we finally settled on a basic set of airfoil parameters that we look for in any new airfoil that we try out. We look for an airfoil that has about 9 or 9.5% thickness and a camber of around 2.5. These all seem to fly well in our particular conditions.

The airfoil has to provide good lift with the ability to carry weight fairly well so that, if we "over engineer", it will not kill us along the way. We look for an airfoil that potentially has a good upper surface that clearly indicates a good bubble ramp so that the separation will be gentle. In addition, we look for a lower surface that is smooth and balanced.

You will notice that we have not used any of the current "technological" terms in our definition of parameters; that's because we are laymen and have found that all that is forecast or written after scientific study is not always the case in the real wind tunnel: the air. Our selection process is based on past experience and what airfoils works well here in Texas. Yes, we do use the statistical data in SoarTech and other documents to gain some insight into the positives and negatives of a particular airfoil; but it still needs to look right and meet what we feel is right.

Following this process a little further, we have played around with most of the possibilities using the HQ airfoils, as they are easy to generate and fly very predictably. From these airfoils we have branched out into the Selig and Selig/Donovan airfoils. When SoarTech 8 came out, I started building the S and SD airfoils one at a time, and trying them out on a standard configuration airplane. The results were most interesting, as some of the airfoils flew considerably better than the data indicated, while others were not up to the real world.

With the advent of the decent computer airfoil generation programs a few years ago, other options for airfoil generation became available. Now, you can take a standard airfoil and change the camber or thickness to match whatever you have in mind. And, you can combine airfoils using the top of one and the bottom of another to generate even more airfoils in ever changing combinations. The options are staggering to say the least.

The idea of using the top of one and the bottom of another has always been interesting to me, as I have felt that improving the top, or smoothing as some have called it, provides better separation. In addition, we noted that in most cases an airfoil that had a cusp at the rear of the lower surface generally carried weight extremely well. So naturally, the next step was to select the top and the bottom to use.

Again, the selection process and the need for good flight characteristics in both airfoils was paramount. After using the HQ airfoils for so long, Dale thought that would be the way to go on the lower surface. But what about the upper surface where one must be careful of the bubble ramp to not throw the whole thing out of kilter? This is where the soul searching came into play.

The selection of the upper surface was skewed somewhat in looking at the Selig and Selig/Donovan airfoils. The one paramount design parameter that was used in the design of these airfoils is that, in almost every case, the upper surface has a very good bubble ramp and the transition at the leading edge is always good. So, which one? Again, the basic parameters we have always used came into play, about 9 or 9.5% thickness and a camber of around 2.5. We looked at many in this range, and actually settled on one that neither of us had flown, but had a good reputation: the SD7080.

Next, it was off to computer land and see what it looked like on the screen and on paper. The first attempt showed that when combining airfoils they have a tendency to change in thickness for some reason. After many adjustments, and comparing the combined airfoils with the original upper and lower surfaces, it turned out that the combined airfoil had a thickness of 9.2% and a camber of 2.3. Well, it was in the ball park from a parameter standpoint, and it really looked about right to boot. Plus, the combination seemed to smooth out the HQ bottom a little, which certainly helped.

After looking at the new airfoil on paper for a while, and endless comparisons to other airfoils, it was time to really find out. Dale made a set of templates and proceeded to cut some cores. As it turned out, we had just finished our OutRider fuselage and the airfoil would match it very well. So, Dale built the wing and finished the airplane, and it was off to the field to see just how crazy we really were. New airplane and totally new airfoil to boot. As it turns out, we lucked out; and boy did we. The K9223 flies far better than it was ever imagined by either one of us, and retains the qualities of the airfoils of its lineage.

We have learned a bunch through this exercise, but probably the most important item to watch in the process is to use airfoils within your parameters and to take your time comparing them with the surfaces of the originals. If you want to drive yourself nuts, or think that there may be a better way, try a combination airfoil on for size.

Oh yes, Dale has started working on the templates for a test Panel for the UIUC testing program just to see what this guy will do in the tunnel. Of course, we are very interested to see the results. ■

Wanted: Flying Site for Glider Tow Fun Fly!

Dear Sailplane Enthusiast,

I am looking for a flying field in the Pennsylvania - Ohio - Delaware area. The idea is to find a central location for a glider tow fun fly.

The fly in could be run along the lines of the Swiss I.G.G. (See "A Chance Encounter with Glider Heaven", *RC Modeler*, November, 1992.), which is a glider tow fun fly that is held every year in Switzerland. We would like to get sailplane enthusiasts in one place and share this wonderful experience. We have three or four towplanes and pilots who are willing to drive, and to help organize the event. It would also be a great opportunity to introduce aerotowing to those that have never had the experience before. As long as you have a nose release in your sailplane, you will learn how to be aerotowed in just one or two flights. Once you have seen it done, and more importantly, if you are towed up by an experienced tow pilot, you will have absolutely no problems at all!

Our towplanes are suitable for towing gliders that range from three meters, up to six meters, or more!

If you have a suitable field and like this idea, please call me at (212) 744-0405 or (716) 385-1495, so that we can discuss this further. I hope to hear from you!

Yours Sincerely,
Robin Lehman

Airtronics Infinity 600 Tricks

...by Steve Savoie
Gorham, Maine

This is just a short list of Infinity 600 mixing combinations that some folks may find useful.

FLAPS ON A SWITCH - Use the bidirectional mixer with the gear as master and throttle as slave. The gear on/off switch activates the flaps. This leaves the more versatile compensation mixer free for other applications.

AILERON TO ELEVATOR SLOPE MIX - I use this to mix up elevator into my small aileron/elevator 2 channel slope planes. The compensation mixer is used with ailerons as master and elevator as slave. Put the mixer on a switch and use the mixer option to slew the elevator up for both left and right banking. This is great for light lift days or for a beginner. Just switch the mixer off for landing or acrobatics.

ELEVATOR PRESET - Glue the momentary switch on with removable hot glue on its exterior surface. Use switches 7, 8, 9 to activate prog #1 (sw7) and prog #2 (sw9) and adjust the elevator only in each snap roll program for the desired deflection. DO NOT USE FOR INFINITY 660; snap roll kills the sticks on 660.

CROW AND CAMBER (on the fly) - I use the compensation mixer on a switch and mix throttle into aux with a negative percent. For launch, just pull flap and ailerons down (normal/mixer off) which will give a good launch and will allow camber changing, including reflex during flight. During the landing approach I ensure the throttle stick is up and I turn on the mixer. Pulling down the flap stick now gives a crow landing configuration.

FLAPS WITHOUT Y HARNESS (polydihederal) - This allows for individual flap adjustment and allows the servos to be set in a mirror configuration. I used this on my Catalina. This can only be done on a poly ship. The flap servos are programmed as ailerons with the aileron and aux channels. Set the end travel limits for reflex and maximum flap with the two servo option in menu. Use the F/E-Aileron mixers to put in flap travel. Set the aileron dual rates on (no switch) and set the rate to zero, then use the aileron-rudder mixer for desired rudder throw.

NEGATIVE DIFFERENTIAL (on a switch) - This I used on an aileron sloper with spoileron landing control. Use the compensation mixer with aileron as the master and aux as the slave. The ailerons are mixed down on either banking direction via the mixer option. Adjust the mix so that with spoileron deployment the aileron on the inboard turning wing just barely drops, then reset the mix percentage a few points. When I get ready to land, I activate the mixer. This works OK; some planes like it better than others.

Notes

1. Unused switches should be turned off, not assigned.
2. Flap preset bypasses flap-elevator mixer; pop offs can be tricky.
3. Use a data sheet to record all set ups.
4. Don't use data reset; too much hassle with changing around the sailplane pigtail connector inside case. Just change the data.
5. Use the directional mixer with master-slave mix option, instead of the compensation mixer, whenever possible to keep the compensation mixer free for complicated set ups that may also require a switch option.
6. Remember, the "Slave Channel Adj" for the compensation mixer limits the travel of the slave through its normal input. This is not the amount of influence the master has on the slave. Set this on less that 20%, and you're in trouble.
7. Be consistent with switch assignments between models.
8. Don't confuse servo reverse numbering with receiver channel designations, only elevator is the same.

■

Understanding Sailplanes

...by Martin Simons

13 Loch Street, Stepney,
South Australia 5069

Flight Without Figuring
Part 5 Continued
More about wing sections

The effects of camber in flight

Imagine a wing with a symmetrical section being held at different angles in a steady airflow of constant speed. Such a flow might come from a simple fan. (The situation is artificial, since changing the angle of attack of a real wing brings with it changes in the speed of flight. For the moment ignore this complication.)

At zero angle of attack, aerodynamic zero, the symmetrical section creates no lift. As the angle of attack increases the amount of lift it gives also increases. If the angle decreases, the lift decreases. If the angle of attack is negative the lift reverses in direction. (This allows an aircraft to fly upside down.)

Over the normal operating range, the relationship of lift to angle of attack is usually proportional. That is, a small angle of attack yields a small lift force, a larger angle produces a larger lift and so on, until the wing begins to stall. Different wing sections stall in different ways, but over a certain range of angles used in normal flight, they all tend to behave very much alike. So long as the flow does not begin to stall the amount of lift is proportional to the angle of attack, above or below the zero lift angle.

It is customary and helpful to represent the variations of lift with angle of attack, by drawing a very simple chart, as in Figure 5. Here, the angle of attack is represented along the horizontal line or X axis, and the lift by the vertical or Y axis. The exact units used do not matter at this stage but it is usual to count the angle of attack in degrees. The lift is plotted as the section coefficient of lift or cl. (Small c, small l, because CL in capital letters usually means something different.) The line showing the relationship between angle of attack and lift, is called the lift curve. The usual convention is to draw the chart with the lift curve sloping up from left to right.

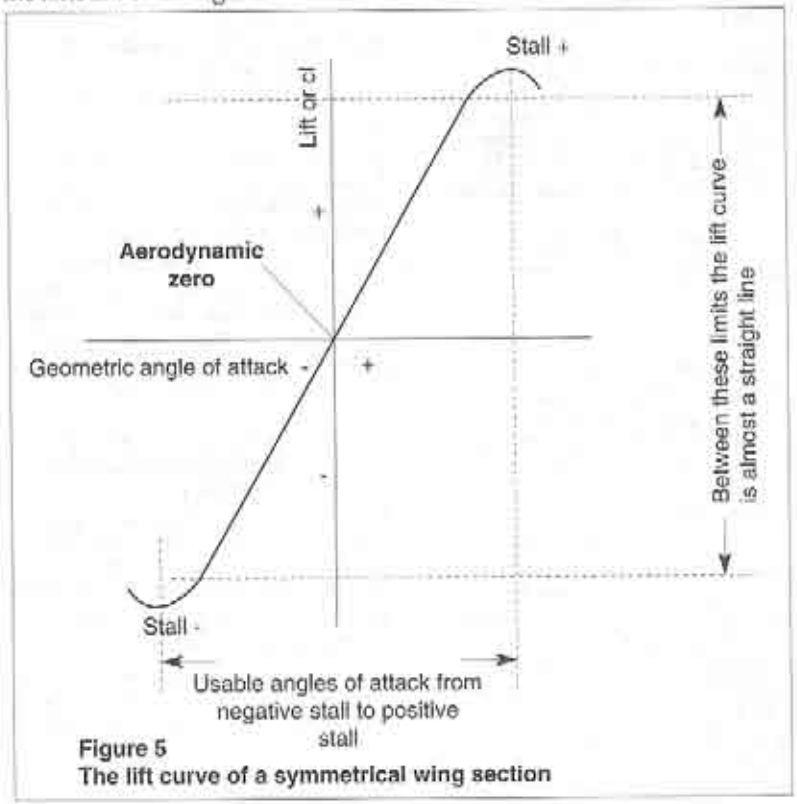


Figure 5
The lift curve of a symmetrical wing section

If the model is being flown very close to the stall, the way in which the lift curve behaves at top and bottom becomes important. Some sections stall gradually as the airflow begins to separate from the trailing edge of the wing. In other cases the flow suddenly breaks away from the leading edge and this produces a very sharp stall. Something more will be said about this later.

It is important to notice that, between the limits marked, the chart of lift against angle of attack is practically a straight line. The part of the lift curve that is most interesting to us is not a curve, but straight. In flight, most of the time, the wing will be operating somewhere within the straight section of the lift line.

This neat state of affairs, perfect proportionality between angle of attack and lift, giving a straight lift curve on the chart, is not always exactly true but departures from the straight lift line are usually quite small and for most practical purposes can be ignored.

Introducing camber

Now imagine that the symmetrical section shown on the first chart, is bent round a new skeleton as a whole to give it a little camber. Nothing else is changed. (Figure 6)

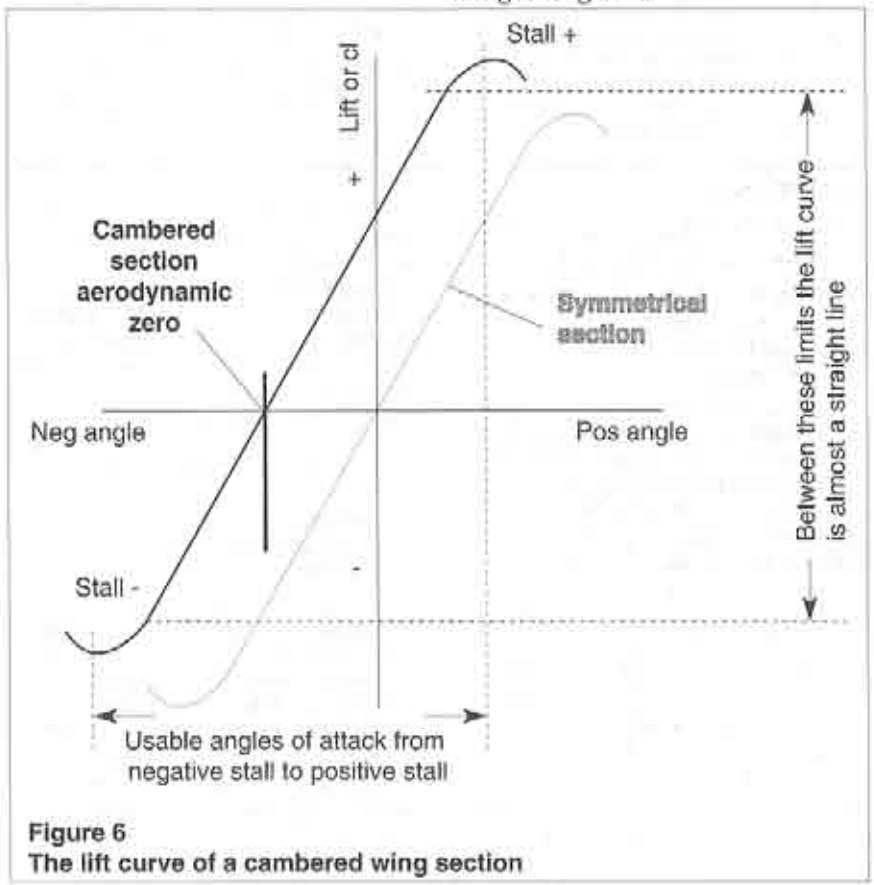


Figure 6
The lift curve of a cambered wing section

The aerodynamic zero of the cambered section is found at a negative geometric angle, as expected.

On varying the angle a few degrees either way, still in the same steady flow, the chart shows the same kind of straight lift line. Not only is the proportionality preserved, but the actual slope of the line is the same. This means that if the angle of attack of the symmetrical section is increased one degree above aerodynamic zero, it will give just the same amount of lift as the cambered section if its angle is also one degree above aerodynamic zero.

If we measure all angles from the aerodynamic zero of a wing section, within certain limits, all wing sections are very much alike. The slope of all the lift curves is about the same. (As before, this is not perfectly true in all circumstances but it is very close to correct in practice.)

There is a change in upper and lower limits. In the positive direction, the cambered section reaches a higher point on the chart before it stalls. It can produce more lift than the symmetrical profile.

Viewing the chart as a whole, we now see the effect of camber on lift more clearly. The lift curve, all the way from negative stall to positive stall, moves up and to the left on the chart. The more pronounced the section camber, as shown by its camber line, the more the lift curve moves to the left and upward. The general shape of the curve as a whole changes very little.

Geometrically, on the positive lift side of the chart, the cambered wing stalls at a **lower** angle of attack than the symmetrical section. This can be of some importance when drawing out the plans for a model and setting the rigging angles of wing and tail.

This geomtrical feature should not be allowed to obscure the fact that the range of angles between **aerodynamic zero** and the positive stall, is larger for the cambered section and so the total lift available is greater.

At angles of attack below aerodynamic zero, things are the other way round. Flying upside down, less lift is available. ■

Book Review

"SAILPLANES! - A Digest for Scale Modelers"

Written by Ferdinando Gale and Aldo Calza

Reviewed by Jim Gray
Payson, Arizona

Here is an interesting source of information for soaring and sailplane/glider enthusiasts. Fliers of full-scale or model sailplanes will appreciate this digest for its historical value and for its extensive coverage of gliders and sailplanes from many countries.

While SAILPLANES!' standard 8-1/2 by 11 inch format may seem ordinary, its thickness and weight provide the reader a clue to its contents - even before the soft cover is opened. The 1-3/4 inch thickness and 3-1/2 pound weight accommodate 718 profusely illustrated pages.

Authors "Ferdi" Gale and Aldo Calza spent over a year compiling the data for their book. They interviewed individuals, and studied earlier books, drawings, and photographs from countries where there has been a soaring and sailplane history. Then followed an extensive sorting, classifying, indexing, drawing, correcting and re-drawing over 500 three-views, and writing new material to accompany them. Finally, the material was assembled into a coherent verbal and pictorial manuscript and sent to B^{2}Streamlines where the final proofing, correcting, and printing was accomplished... an ambitious international effort!

SAILPLANES!' preparation and documentation, however, is only part of the story. Ferdi and Aldo intend their book for flying-scale glider and sailplane modelers who desire information about unique, unusual, and often little-known designs which allows them to create a model that flies well and represents a miniature version of the full-size aircraft. Such information is a vital part of this digest.

The authors know, from their own years of building and flying sailplane models, that a model builder also needs specific information about adapting a full-size machine to flying model requirements, so Ferdi wrote the chapter "Scaling Sailplanes". He knows that a mere reduction from full-scale to model dimensions is only the beginning. True scaling involves, among other factors, consideration of weight and "scale effect"; i.e., Reynolds Number.

This chapter also treats design calculations, measurements and derivations. It discusses the meaning and purpose of polar curves of performance, and how they are used to compare full-size and model aircraft at a glance. Lift/drag curves for various airfoils are explained, and illustrate scale effect penalties. There are corresponding tables and documentation detailing individual aircraft. Ferdi also provides a method for insuring predictable behavior of a scaled model sailplane, and suggests some airfoils to achieve desired performance while retaining scale appearance. His equations are clear, simple and pertinent.

The remaining, and major, portion of the book is the sailplane compendium which consists of three-views of each sailplane, done by Aldo Calza. Each sailplane is listed alphabetically within its country of origin, also listed alphabetically for easy reference. An interesting result of this classification applies to Germany, and includes three categories: "German Sailplanes prior to 1945", postwar sailplanes of the Federal Republic of (West) Germany, and postwar sailplanes of the People's Democratic Republic of (East) Germany. While many unique designs and examples of the world's sailplanes from various periods of history are covered, this reviewer was disappointed to find some popular and well-known types missing from the compilation, but pleased to find others previously unknown (to me).

Of particular interest is a short section including 15 gliders and sailplanes from the former U.S.S.R., only a few of which had I previously seen. Some sailplanes of the former Eastern Bloc countries are separately presented under their own national headings.

SAILPLANES! is a "browser" of a book for any reader and enthusiast, and a good source for a modeler seeking information about a particular aircraft. Although some of the sailplanes depicted have errors of shape and outline which could render them questionable for absolutely accurate scale representation, they should not deter the builder of a "stand-off" scale model from choosing that particular design. Neither will they be of any concern to the casual reader. The precision scale modeler always consults many and various sources of information before beginning his model, and compares them to select the best representation for his purpose. Therefore, one need not be discouraged by any slight errors which may be discovered. I encourage the acquisition of this book as a useful addition to your own library, whatever your special aeronautical interest may be.

SAILPLANES! is priced at US$58, including packaging and postage to any destination, world wide. Order your copy from the publisher, B^{2}Streamlines, P.O. Box 976, Olalla, WA 98359-0976 USA.

At the time of this review, SAILPLANES! is NOT available by airmail. However, if you need other than ordinary surface postage, or if you have special requirements for shipment, the publisher will be happy to discuss them with you.

B^{2}Streamlines publishes other interesting books dealing with sailplane design and construction, including tailless/flying-wing designs, a bound collection of their "On the 'Wing..." columns from *RC Soaring Digest*, some of Ferdi Gale's other books, as well as other aeronautical titles. Please ask for a catalog when you write.

I wish to personally thank the Kuhlmans, Ferdi Gale, and Aldo Calza for making their masterpiece available for this review. ■

History Corner

The Wright Brothers' Gliders:

Historical Background and Technical Development

...by Yanni Tsipis (Senior Author)
Contributing Authors: Matt Slater, Megan Zak, Mirit Sabag, Nyla Manning

Prior to their first powered flight in late 1903, the Wright brothers built three unpowered experimental gliders. These gliders acted as test-beds for aeronautical data and new control mechanisms that the brothers eventually developed, and then implemented on their powered aircraft. Equally important, the brothers learned to fly on these gliders. The data and experience obtained through the three years of glider testing led the brothers to build their powered flyer with refinements never before seen in the world of aviation: refinements that led to their success after centuries of failure by others.

This article will focus on the glider phase of the Wright brothers' contributions to aviation, and will detail the technical and flight characteristics of the three gliders they built before the *Flyer*. By way of introduction, comments are included on some of the more significant pre-Wright attempts at flying machines. A section devoted to modellers will follow, giving notes of consideration, and resources available for those interested in recreating these historically significant aircraft.

One of the earliest documents on human exploration of flight comes from Italy. In the late 1400s, Leonardo da Vinci set out to conquer the air with man-powered ornithoptic flying contraptions. The majority of his flying designs were ornithopters: man-powered emulations of birds. Unhindered by any accurate understanding of the laws of physics, Da Vinci designed large, clumsy flying contraptions in which the pilot lay prone, flapping cloth wings. He devised elaborate pulley transmission systems to control the flapping. From his rudimentary sketches that we now possess, it appears that he began to tackle the problem of controlling an airborne vessel.

During the period 1486-1490, one of his ornithopter sketches details the inclusion of a rudder-elevator, in the form of two crossed triangular panels fixed to a shaft at the rear of the aircraft. This kind of mechanism would not appear again on an aircraft design until 1799, when English researcher Sir George Cayley adopted a similar crossed-fin mechanism on his first design. On a subsequent sketch (dated 1499-1503), Da Vinci details an elevator-like surface which (apparently) was meant to replicate a bird's tail. The intricate design allows the pilot to swivel, spread, and contract the surface, much as a bird in flight moves its own tail feathers. Unfortunately, history shows that Da Vinci's ingenuity led him astray. His quest to imitate flapping birds proved a dismal failure - foreshadowing the fate of other aviation enthusiasts for centuries to come.

Da Vinci did design other flying contraptions, including balloons, helicopters, and gliders. Unfortunately, his genius for design was wasted, coming as it did hundreds of years before any clear understanding developed of the forces exerted on flying bodies. While intricate and impressive, Da Vinci's flying machines were not air worthy. He appears not to have made any research into the problems of lift and wing design, and his birdlike designs thankfully never made it past the drawing board.

Da Vinci's sketches and writings lay dormant for centuries. His ideas were not published until the late 1800s, by which time aviation science and technology had passed him by. One researcher that did influence aviation, the person regarded as 'the Father of Aerial Navigation' was Sir George Cayley, an English baron who became fascinated with the prospect of heavier-than-air flight in 1799. It was Cayley who began attacking the problem of flight with insight into the dynamics of air. In 1799, he inscribed onto a silver disk a diagram of a fixed-wing glider

with wings that appear arched, i.e., to possess the necessary curvature (airfoil) for lift. On the other side of the disk he etched a diagram that correctly identified the lift and drag vectors. Having identified all three forces acting upon a body in flight (lift, drag, and gravity), Cayley began work on designing flying machines with fixed wings. In the early period of his research, Cayley observed birds in flight, and hypothesized that lift came not from the flapping of the wings, as had been previously accepted, but rather from the curvature, or camber, of the wings. Armed with his new theory, Cayley designed gliding machines with fixed, curved wings. He published aeronautical papers stating that lift was generated by low pressure on the upper surface of a cambered wing. To this end, he designed his aircraft with cambered surfaces, believing that curved surfaces generate more lift than do flat ones. These discoveries placed Cayley in the forefront of aviation research.

FIGURE 1
THE 1900 WRIGHT GLIDER
© Copyright 3.8.95 Yanni Tsipis

By the mid-late 1800s, a slew of aeronautical researchers had joined Cayley in attempting to produce a viable flying machine. English, French, American, and Russian engineers designed and built machines and airfoils - with mixed success. In Germany, the engineer Otto Lilienthal began researching the aerodynamics of bird flight as the basis for manned flight. He published a work of extensive aeronautical data in 1889, based on his observations and subsequent calculations. With the knowledge acquired for *Birdflight as the Basis of Aviation*, Lilienthal set to work building and flying aircraft with airfoils built using the data he had collected. This data suggested that the most efficient camber for an airfoil was 1:12 - that is to say 8.33%.

Between 1891 and 1896, Lilienthal developed and flew a series of curved-wing hang gliders, controlled by shifting the pilot's weight about the underwing bar to which he clung. Lilienthal hoped that the resulting shift of the plane's center of gravity would be sufficient to control it. Other aviation enthusiasts built gliding machines that relied on the same control philosophy. Although these contraptions flew, their airfoils were unfortunately inefficient, their designers having performed few laboratory experiments prior to construction. Not only did the airfoils from these crude 'flying machines' generate insufficient lift, they relied on very precarious means of control, as well. The pilots learned, to their dismay, that these aircraft displayed a stability threshold much like that of a bicycle. In level, swift flight, the weight-shifting of the pilot sufficed to make the aircraft respond as desired. If, however, a gust of wind upset the attitude of the aircraft, or the aircraft stalled, the pilot could not adequately control the aircraft merely by shifting his weight. This fundamental shortcoming was dramatically demonstrated in 1896, when premier researcher Otto Lilienthal was killed when his hang glider stalled uncontrollably. The time had come for the development of a new control system. Without it, practical, safe aircraft would remain a

pipe-dream.

In the mid 1890s, two brothers in Dayton, Ohio, became interested in the prospect of manned flight. Wilbur and Orville Wright, who owned and operated a bicycle repair and sale shop, followed the newspaper accounts detailing Otto Lilienthal's flights in Germany. Lilienthal's untimely death in mid-1896 is said to have piqued their interest in the problem of stable flight. They began reading works concerning ornithological matters pertaining to manned flight, and soon became so keenly interested that they wrote to the Smithsonian institution asking for further works on the possibility of manned flight. As one might expect, their first thoughts concerned the problem posed by the widely accepted method of controlling the machines flying at the time — the weight-shifting technique that killed Lilienthal was clearly inadequate. They set to work designing a better system, for use in a different type of glider — a structurally sound biplane in which the pilot was prone on the bottom wing.

The new system devised by the brothers involved warping opposite wings to re-balance them when the plane's attitude was upset. This "wing warping" control system was used in lieu of modern ailerons well into the First World War. The first test of this new system came in 1899, when the brothers tested a small biplane kite, controlled by strings fixed to each wing. The flights were a success, demonstrating the effectiveness of the new system. The brothers now became more ambitious, and set out to produce a full-sized glider capable of carrying a person.

In mid-1900, Wilbur began making inquiries to the National Weather Bureau, in search of sites in the country at which winds of at least 15 m.p.h. blew constantly, and inclement weather was at a minimum. The bureau made suggestions that led Wilbur to correspond with the office at Kitty Hawk, on North Carolina's outer banks. A site was chosen, and Wilbur set off alone in September to begin work on the first full-scale glider. Upon arriving at Kitty Hawk, he began assembling the prefabricated bi-plane glider. It had a seventeen foot wing-span, and a cord of five feet, giving it the aerodynamically inefficient aspect-ratio of 3.4. The wings were stacked directly atop one another, separated by twelve long braces. The wing ribs on the upper surface were curved, because the brothers knew from reading Lilienthal's work that cambered wings provide more lift. While Lilienthal had asserted that a 1:12 (i.e., 8.33%) camber was the optimal camber, Wilbur, acting more on personal intuition than any accepted data, decided to produce thinner wing ribs with a camber of 1:22 (i.e., 4.55%). He believed that a shallower camber would increase the stability of the aircraft, which it apparently did. The lower wing, however, was flat. The placement of the high point on the wing was quite arbitrary, at about three inches aft of the leading edge. The ribs were spaced one foot apart, and the wings were connected by five foot struts, set flush with the leading edge, and a foot forward of the trailing edge. The struts were hinged at the points at which they joined the wings to allow for wing-warping. The entire machine was held rigid with a wire truss system borrowed from bridge engineer, and the Wright brothers' avid correspondent, Octave Chanute. A small forward horizontal rudder was fitted ahead of the wings, supported by rods leading from the top and bottom wings. The entire wing area was covered by a sateen cloth, to provide a smooth, unvarnished finish. (Fig. 1)

The first flight of the glider came in October, 1900. The brothers found that the wings of their glider were unable to provide enough lift to sustain the machine in level flight, even with the wind blowing at 25 m.p.h. Whenever the aircraft was flown, it remained tethered to the ground. The glider would remain airborne only if it met the strong wind at a drag inducing high angle of attack, estimated by Wilbur to be at least 20 degrees. Even when the wind gusted, raising the

wind speed of the glider to over 30 m.p.h., the machine still required an angle of attack of at least 10 degrees to keep it in the air, thus making free flight impossible. The brothers pondered this question, disappointed that their first attempt at flying was a failure — their machine was not so much a free-flight glider but a tethered kite. They later found that the wing loading of this machine was too high. The aircraft had been built with an approximate loading of one pound per square foot. However, without the weight of the pilot, the plane's performance improved somewhat. Furthermore, the brothers were satisfied with the unmanned tests of their control systems.

The brothers also discovered a phenomenon not previously thought possible, given the theory of air pressure, then current in the aviation community. This theory held that the pressure from the air would be concentrated at the front half of the wing, and that it would not change in flight. During their tests, the Wrights discovered that the plane inexplicably dropped or lost lift, as if the air pressure effect had been suddenly canceled. The Wrights ascribed this unexpected phenomenon to a shift of the center of pressure on the wings - the center of pressure moved forward on the wing as the angle of attack decreased. As they saw it, if the angle of attack was decreased enough, the center of pressure would pass beyond the leading edge, thereby negating the lift capabilities of the wing.

Disappointed by the poor performance of their first glider, the brothers packed up and left Kitty Hawk, hoping to return later with a second, more refined and more thoroughly researched glider.

After the brothers' disappointing test flights with their 1900 glider, a second craft was constructed to correct the lift deficiencies displayed by the shallow-winged, first machine. The Wrights decided to adopt Lilienthal's suggested 1:12 camber, rather than their 1:22 curvature, and opted for a larger wing. To increase the lift from their wings, the brothers increased not only the size of the wings, but also their loading, perhaps to make up for the loss of stability inherent in the new, deeper wing camber. The increase in wing-span and surface area provided an increase in lift without creating excessive drag that could hinder lift. The wingspan had been extended to 22 feet 7 inches, and the wing area to 308 square feet. The new glider would weigh 98 pounds empty, just over twice the weight of the first. All of these changes were made in the workshop set up at Kitty Hawk itself.

By mid-1901, the second glider was ready for its tests. The winds on the first day of testing were only about 10 m.p.h., less than the brothers would have liked. The glider would not be tested as an unmanned kite first, as had been the case the previous year. The machine was brought halfway up a 100 foot hill, and run down to gain airspeed prior to manned release. After several flights which carried the glider and its operator only a few yards, Wilbur moved his weight towards the trailing edge about one foot. This shift in the center of gravity made possible one flight over 300 feet. It was found that extremely rough and full-power use of the elevator could keep the plane stable, a phenomenon not found on the 1900 kite. After several more flights, some long, some short, some precarious, the brothers decided to make field changes to their machine. The lifting power of the wings was not what the brothers had expected and needed; even at an angle of attack of about 6 degrees the machine performed poorly.

The brothers made several field modifications. They changed the camber to a much shallower 1:20 now, and moved the high point to about one foot from the leading edge of the wing. The elevator now appeared to be more responsive, and required less force to activate. What is more, the glider had a better glide angle as a result of the changes. This improvement in performance was heartening. But up

to this point, the brothers had only attempted straight line glides. They would now attempt a turn. The first attempts at turning, using the wing-warping mechanism combined with the forward elevator, were also disappointing, and dangerous. It was found that as one wing was warped upward, it rose, but also lost airspeed, as the warping created drag. This phenomenon threatened to make the plane turn not into the bank, as had been wished, but rather turn toward the upturned wing, making the aircraft tumble and begin to spin on an axis perpendicular to the wings. This phenomenon frustrated the brothers time and time again, and they gave up their testing in August, 1901. On the train back to Ohio, an exasperated Wilbur proclaimed gloomily that he did not expect man to fly in his lifetime, much less in a thousand years.

While the brothers had previously questioned the data given by Lilienthal in his works, they had still used his figures to design their 1901 glider. When this second glider of theirs failed to live up to their expectations, the brothers came to the conclusion that Lilienthal's data was seriously in error. In late 1901, they set to work in their Dayton shop to test Lilienthal's data. They built several basic testing rigs, including an ingenious set of instruments to accurately determine the lift and drag characteristics of various airfoils they constructed. These they tested in a six foot wooden wind tunnel they built in their workshop. Most of these devices were made using little more than what the brothers found around their bicycle shop. Their tests showed Lilienthal's data to be severely flawed. The brothers' investigations of over 150 test sections in their wind tunnel helped them refine their views on the wing with the greatest efficiency for use in their next glider.

Armed with their own, more reliable, wind-tunnel data, the Wright brothers produced a third glider. The new glider had a 32 foot wingspan, and a reduced chord - 5 feet, instead of the 7 feet used in the 1901 design. The higher aspect ratio wing, coupled with a shallow camber of 1:24 (i.e., 4.17 %) made for a much more efficient flying machine than those previously built by the Wrights. The new glider was also disproportionately lighter than their earlier machines, weighing only 112 pounds. Another change made as a result of their extensive wind tunnel tests was the shifting of the camber's apex to 20 inches behind the leading edge. In addition to these refinements, the brothers added a tail to their new aircraft. Two fixed vanes were set on spars extending back from behind the pilot. The tail was supposed to correct the difficulties encountered in turning by applying stabilizing, centralizing pressure on the aircraft. The Wrights planned to use the fixed tail to arrest the tumbling, or spinning motion of the plane in the turn.

When the aircraft was first tested Wilbur pranged. However, he attributed the accident to his lack of familiarity with the controls, combined with a sudden gust of crosswind that caused the aircraft to bank sharply and nose over. After this initial mishap, the glider flew smoothly, and was able to turn without incident. As testing continued, however, the brothers discovered an unexpected new problem with banking turns. They noted that as one wing rose slightly, the glider would sideslip in the opposite direction, dragging the high wing higher still, eventually causing the machine to enter a spiraling spin. Fortunately, the glides were made at altitudes of less than 30 feet, and damage to the glider and pilot was minimal. When the glider went into one of these spins, one wing tip was invariably jammed into the sand, throwing the other tip around in a loop. The Wrights attributed this newfound problem to the tail. As the plane began to turn, it lost airspeed as it went into the spin. The (vertical) tail now acted as an elevator, forcing the raised wing further up around the vertical axis of the aircraft. The brothers concluded that if they made the vertical tail movable, the problem should be alleviated, by reducing the elevator effect created by the fixed tail's resistance to the air in a sideslip. They devised a control system for the movable tail tied directly to the warping controls, after Wilbur's realization that the movement of the tail should be coordinated with that of the wing. This was the first example of the combined rudder and aileron control system used for turns in flight today. The new system was tested and found to perform flawlessly. The brothers made many additional test flights, some over 600 feet long. With these changes, the problem of aircraft control, that had eluded aviation enthusiasts for centuries, was solved. Their perfected glider now required some means for generating thrust for sustained flight. The next flying machine that the Wright brothers built would change the world, and prove the feasibility of powered, controlled manned flight.

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■

We wish to thank Alan Schwerin of Lake Charles, Louisiana for sending in this article on the "Wright Brothers' Gliders". It was written by some of his students, who did a great deal of research into this subject. Thanks go to: Yanni, Matt, Megan, Mirit, and Nyla. As Alan suggested, this could be the start of a new column called "History Corner". ED. ■

A Note To Modellers

...by Yanni Tsipis

The Wright gliders would make extremely interesting modelling experiences, both for static and flight modellers. The woods used on the original aircraft were pine for the majority of the ribs, and spruce for the wing spars. Repair of the original aircraft had to be undertaken quite often, but the structure was quite intricate. The ribs were made by seaming the wood and molding them over templates. It should be noted that the ribs were fully curved on both surfaces, unlike most of today's models, so brittle woods such as balsa should be approached with caution for use in building the wing ribs, as they would split chordwise easily at the extremeties.

It should also be taken into consideration by flight modellers that none of the gliders actually flew particularly well, and only when properly balanced and weighted. The 1900 glider could only be effectively built as a tethered kite, and the subsequent two gliders also would not perform well with high-velocity launching systems. Their now peculiar configuration of having a horizontal stabilizer in front of the wing would make the act of effectively balancing a flight model very quirky. In addition to this shortcoming, RC modellers would be discouraged to find no enclosed fuselage in which to house any equipment. It would perhaps be more interesting to create a flight model of similar configuration, using different airfoil designs, in an atempt to one-up the pioneers of flight. Plans for the original gliders are not in existence, as they were built and modified in the field, with no mention of plans given in all the combined researches. If interested, it is likely that a request to the Smithsonian in Washington, D.C. would provide adequate 3-view schematics of the aircraft. ■

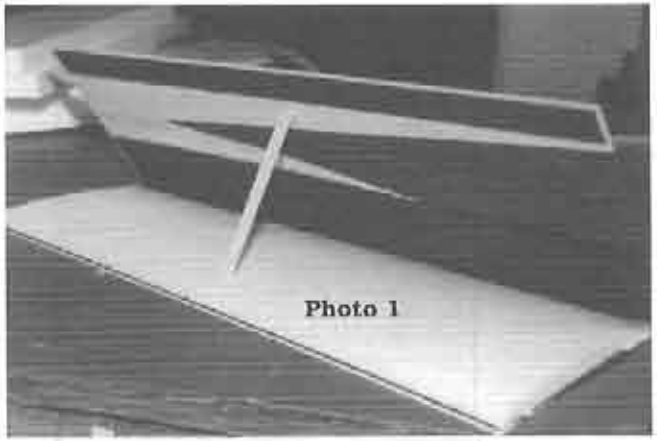


Photo 1

Photo 2

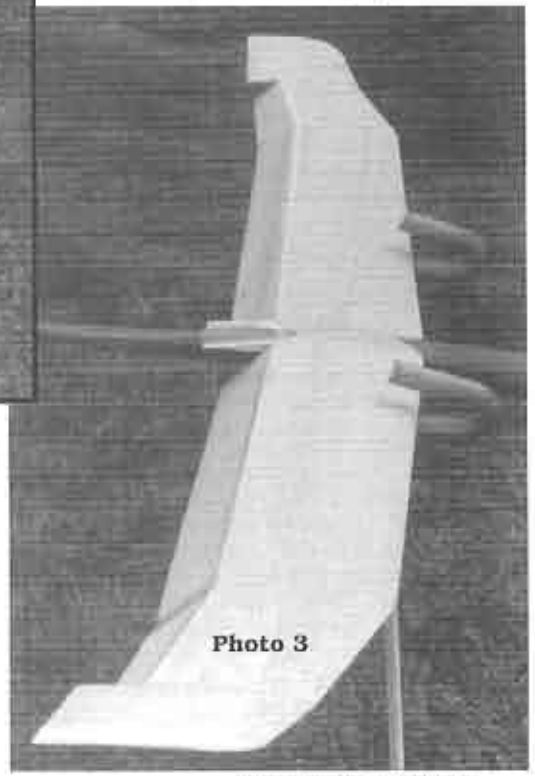


Photo 3

The Continuing Evolution of the Monarch

...by Sherman L. Knight
Bellevue, Washington

By now, just about everyone has heard that at the LSF Nationals, all of the top ten handlaunch finishers were full-function aileron ships. This represents quite a change from the past and is the wave of the **future**. Unfortunately, the inclusion of ailerons/flaperons has turned some hand launch contests into landing contests. What attracts me to hand launch is the flight, **not the landing.**

Hand launch rounds, typically known as shoot-outs or add-em-ups, do improve your flying skills. However, flying a 15 second first flight and then increasing each flight after that by one second is really nothing more than an experiment in control and is not a statement of your ability to **thermal** a hand launch ship.

Enough editorializing. The remainder of this article is on the continuing evolution of the Monarch. An earlier article was published in August of 1995 issue of *RCSD* concerning the evolution of the Monarch from a polyhedral

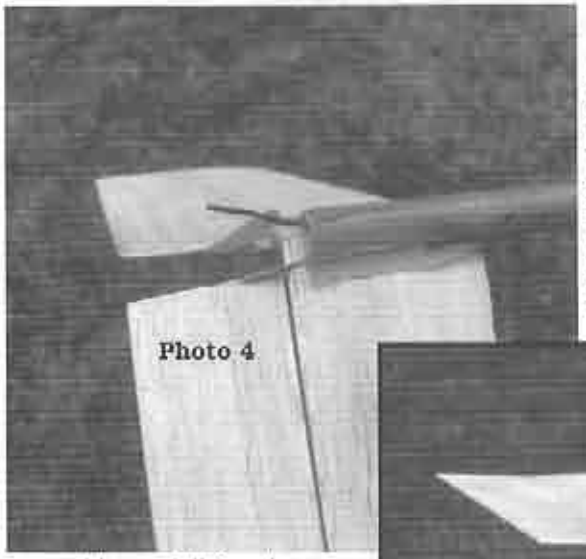


Photo 4

Photo 5

ship to a full-function flaperon ship. The purpose of this article is to discuss the continuing refinements and the thinner 94 wing.

The new 94 fuselage is just as light as the old one. However, they have added slightly more area under the canopy to allow for the easier placement of servos, receivers, etc. Also, the "wing saddle" area has been enlarged making wing incidence adjustments available.

The 94 fuselage also includes additional Kevlar tow in strategic locations of the fuselage to increase its strength.

The Wing.

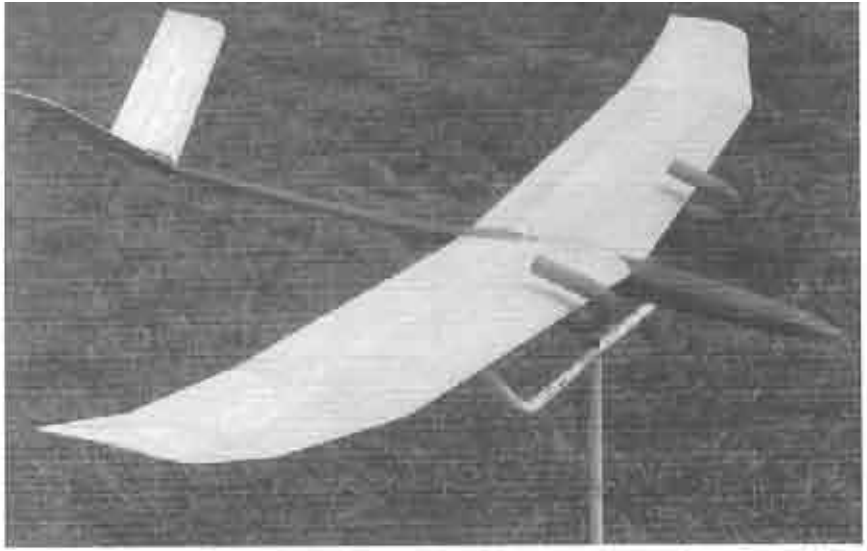
Photo 1 will give you a better impression of the carbon-fiber veil lay-up from the inside of the balsa sheets. The veil weighs approximately 3/10 of an ounce per sq. yd. Be careful. If folded back on top of itself, it will break. Also, the weave has a bias to it. If pulled in one direction, it comes apart very easily. Turn it 90 degrees and pull and it's nearly indestructible. Make sure that you cut your carbon fiber and lay it out in the indestructible direction.

In the photo, the 1 inch wide area of carbon fiber veil is actually at the leading edge. Because the flaperons are so large, the 2 inch wide carbon fiber veil at the trailing edge is installed to increase the stiffness of the control surfaces.

The 94 wing is incredibly thin. The addition of the carbon fiber does not add significant bending strength to the wing. However, it does add a significant amount of stiffness. The wing itself is much more resistant to twist (i.e., possible high speed flutter).

In my earlier straight wing experiment, I pre-glued the inner and outer form cores together and laid up the entire wing in one piece. On the day I bagged the 94 wing, I'd been to 7-11 earlier and suffered from a chronic brain freeze after downing a large slurpee. Anyway, I wound up building the wing in four separate pieces instead of two. For days I wandered around the house wondering how I had done something so foolish. However, I decided to continue forward with the experiment and simply glued the wing tips onto the center sections with thick CA. **I did not lay any fiberglass tape at this wing joint.** I've never had a failure at this location and don't anticipate one.

This means, that if you have an already pre-sheeted wing kit, I believe you can probably make these aileron modifications without any difficulty.



The question that everyone asks is, "How deep do you make your ailerons?" If you read all the books and the manuals, they typically indicate an aileron depth somewhere between 12% and 18%. I'm a firm believer in the adage if you simply follow the leader, you can never win. I was interested in experimenting with changing the shape of the wing in flight. This meant not simply cambering the trailing edge, but trying to change the shape of the entire wing. Therefore, I opted for full-span flaperons that are 33% of cord. As you can see from photographs 2 and 3, the control surface area is huge.

I couldn't find any Cannon servos, so I opted to use the Airtronics 501. If you opt to use the same servo, be careful when ordering it. The 501 servo comes with a single servo wheel with extremely **short** servo arms. I strongly recommend that at the time you order the servos, you also order the extended servo arms. But, be careful. The 501 output gear is extremely small and a standard Airtronics servo arm does not fit. Longer servo arms for the 501 must be specially ordered.

Do I like control surfaces this big? You betcha. My next hand launch is also going to have control surfaces this large.

However, the next experiment will be to put the hinge line for the flaperons on the bottom of the wing. A significant amount of lift from hand launch airfoils comes from the under cambered section at the rear of the wing. Unfortunately, that's just about in the same location as the control surface cutout. Theoretically, hinging on the bottom should result in a smoother lower surface, and with a control depth at 1/3 of the wing, I'm hoping that the upper control surface cutout will actually be inside of the separation bubble. This should reduce the overall effect of parasitic drag.

The center section was sanded to approximately 4 degree dihedral. The 4 inch long wing tip panels were sanded to approximately 8 degree polyhedral. After some flying, the aircraft was a little too skittish. The Monarch returned to the workbench to increase in the center section dihedral angle. This joint was already covered with 1 inch fiberglass tape and thin CA. I was worried that the removal of the tape would damage the balsa wing skins.

In discussing the removal of the fiberglass tape with Phil Pearson, he simply recommended trying some heat from a heat gun. Well, it worked and it worked well. I applied a little heat from the heat gun, put the tip of a No. 11 blade under the edge of the fiberglass and it simply pealed off the balsa wood. It did not pull any of the balsa wood with it. (What a relief.) I increased the polyhedral angle to about 6 1/2 degrees, applied the new tape and went flying. This new angle is much better.

The Tail Surface.

Photo 4 shows the location of the control wires as indicated in the plans and specifications. As you can tell, a small cutout must be made in the side of fuselage very close to the leading edge of the V-tail. This cutout unfortunately weakens this particular area increasing its likelihood for failure.

Photo 5 is a modification to the plans and specifications. As you can see, the control wires and horns are all inside the cone of the fuselage. Not only is the fuselage stronger at the leading edge of the V-tail, but it's slightly more streamlined.

The Setup.

Photo 6 shows the inside of the fuselage. The five channel receiver is from RCD. The receiver weights 1 oz. Without the case it only weighs 1/2 oz. Although it may not seem like much, that 1/2 oz. is equal to 5% of the aircraft's overall flying weight.

I have also started using 250 milliamp battery packs. In the Monarch, this typically means it must be placed as far to the rear as possible. You might also opt to move one of the servos all the way up in the front end of the aircraft with the battery pack between the servo and the receiver. Personally, I never place the battery pack behind the receiver. A hard landing may result in the battery pack coming loose and possibly destroying the receiver.

Control surface setup is always a matter of personal taste. But there are many things that can be done to make a good flying airplane fly even better.

The projected rudder area of the Monarch is actually quite large for the surface area of the wing. An excessive amount of rudder throw can actually induce a tip stall. Therefore, I typically fly with an aileron differential of between 4:1 or 5:1. By flying with such a large differential, I can decrease the amount of rudder mix with my ailerons. The barrel rolls are ugly, but the purpose of this setup is to provide the best possible thermal turn.

With four servos, and extremely large control surfaces, I can literally change the shape of the wing in flight. My radio is set up to automatically increase camber when pulling up elevator. At full up elevator, there is approximately 3/16 of additional camber at the trailing edge. A tighter turn radius can be obtained with less elevator deflection. The wing lifts the airplane into the turn instead of being steered into the turn with the elevator. This is a more efficient means of turning. The aircraft loses less energy in the turn (doesn't slow down as abruptly), reducing the dreaded pilot induced stall when turning too quickly. Of all the different mixes available, I found this one to be the most useful and beneficial to my flight times.

Photographs 2 and 3 show the flaperons in the full down flap position. In this position, at a 45 degree nose down angle, the Monarch accelerates to a whopping 7 or 8 mph. In any kind of a head wind, it starts to fly backwards.

The latest Monarch version weighs a whopping 11.2 oz. This includes all four servos and the 250 milliamp battery pack.

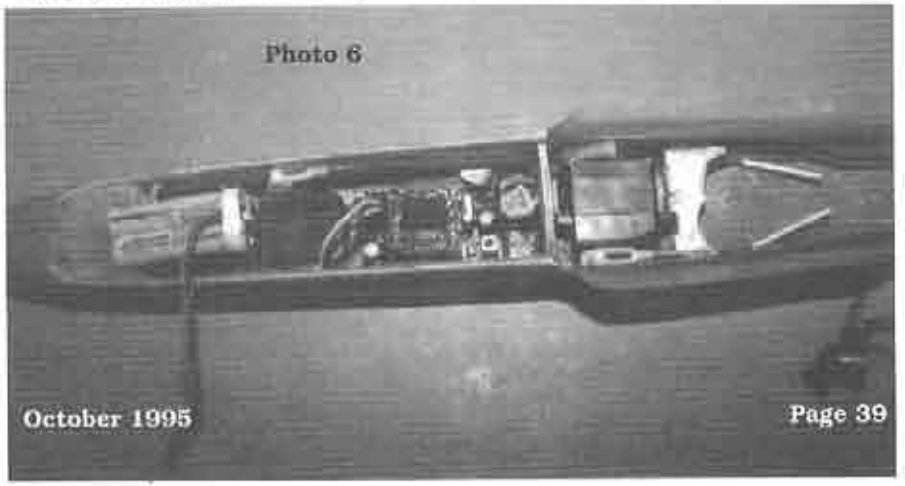


Photo 6

Wing Incidence.

The most frustrating part of building any V-tail ship, is the establishment of the wing to tail incidence. Ideally, with neutral elevators, the aircraft will recover very, very, very slowly in a dive test. The problem with the Monarch and other small V-tail aircraft, is that once the V-tail is glued in place, changing it is relatively difficult. However, there are a couple of different things that can be done.

First, the area of the tail can be re-heated with a heat gun. If the V-tail is originally installed with CA glue, and without the fiberglass tape indicated in the plans, the glue comes apart quite easily with a little heat.

Another option is to increase the incidence at the wing by raising the wing's leading edge. If your initial flights of your Monarch indicate that you have to include up trim (from neutral elevator) to get the plane to fly slow and level, you can easily fix that problem by changing the wing incidence. The leading edge of the wing is held in place with two pins inserted through drilled holes in the fuselage bulkhead. By enlarging those holes vertically, you can increase the incidence at the leading edge of the wing. Using your heat gun, you can adjust the generous wing saddles on the fuselage to accommodate the new incidence. I like to increase the wing incidence on the Monarch anyway. This raises the tail in relationship to the wing and contributes to a much easier thermal type turn.

Flying.

Large control surfaces give you the ability to try lots of different things. Mixing increased camber to up elevator is a must. Placing additional camber adjustments on the throttle stick provides all kinds of new options. The most interesting one is significantly increasing the camber when turning downwind on long downwind legs. On a downwind leg, the aircraft actually increases altitude.

Most interestingly, the other day I flew into a fairly strong thermal about 50' off the ground. I had already switched the radio to landing mode so when I pulled the throttle stick, the flaps came down the full 45 degrees. The airplane stopped, hovered, and then just started going up. It wasn't even turning. Unfortunately, I've never been able to repeat the experience.

My definition of high performance is a little bit different from everyone else. The pilot that makes the fewest mistakes wins. An airplane that is **easy to fly** will result in fewer mistakes. Good lift potential combined with ease of flying is important. An airplane that helps you make fewer mistakes **is high performance.** The ability to snap roll on a dime is not nearly as important as winning contests.

Because a good portion of hand launch flying is done within 50' of the ground, mistakes are disastrous. Flying smooth is critical. Smooth flying airplanes result in fewer mistakes. Your computer radio may also help reduce mistakes. If you have a radio that allows exponential mixing (takes the twitchiness out of center stick but allows full throw and motion of your control surfaces), I would highly recommend it. By softening your controls near center stick, the ability to fly smoothly is enhanced. In hand launch (at least here in the Pacific Northwest), the ability to fly smoothly, when necessary, is darned important.

I'm always asked to compare the aileron hand launch with the polyhedral version. Although it is difficult to state which aircraft is more competitive, I can say that once I started flying the aileron version, the polyhedral wing never saw the light of day again.

Warning.

Hand launch fever can be terminal to all your other models. If you take your unlimited to the field to practice some spot landings, **leave your handlaunch at home.** Once your handlaunch comes out of the car, the other airplanes never even get assembled. Hand launch is easy, it's fun, and the most enjoyable form of thermal duration flying today. Thanks again to the members of the Seattle Area Soaring Society for their enthusiasm and support of handlaunch and the fresh new ideas it has brought to the sport. ■

Fourth Annual Mid South Soaring Championships

...by Ron Swinehart
Huntsville, Alabama

Once again, the labors and plans of many people came together in what was probably the smoothest, best organized contest we have held to date. The weather was exceptional, for the middle of June in North Alabama, with highs in the mid 80's instead of 90's, with a fairly low humidity. In fact, the guys in from California (RnR) thought the evenings were the same as back home. One hundred and thirteen signatures were counted on the safety declaration from nineteen states, with the farthest being from Washington. We also had entries from California, Pennsylvania, Ohio, Michigan, Missouri, Kansas, Illinois, Texas, New Jersey, North Carolina, South Carolina, Virginia, Georgia, Tennessee, Kentucky, Florida, and Alabama.

The cross country event was held on Thursday and Friday (15 & 16 June) and was CD'ed by Rob Glover. His report on this event will be described in detail later, but needless to say, every one of the teams entered expressed the same comment; it was a great course with terrific facilities.

The primary thermal site, Hobbs Sod Farm on Martin Road, was set up early Friday AM, in preparation for the hand launch event which was CD'ed by Rex Powell. This event got under way at 11:00 AM with a total of 27 entries. It appeared that there were lots of thermals, and even with the large entry, the five rounds were completed by 3:00 PM. This event was flown man - on - man, with each round being flown with a different flight grouping. Joe Webb and his son, Chris, did the computer scoring, while Joe Byrd and Geroge Batiuk handled the impound area.

The thermal events got under way Saturday, again under near perfect conditions, with light winds from the south. One hundred and five contestants flew five rounds of 3-5-7-7-7 minute thermal duration with each round being worth 900 points with an

Thermal Duration

Overall Winner, Kendall McDonald, Tullahoma, Tennessee

Bob Sowder, 1st Expert, Saturday

Scotty Meader, 2nd Expert, Saturday

additional 100 points being awarded for a perfect L-4 landing. The flights could be flown in any order, but one of each time duration was required. The flying started at 9:50 AM and the five rounds were completed by 4:20 PM. Don StGermain, Rob Glover, David Godfrey, and many others did yoman service on the winch line, as did Bud Harris, Joe Byrd, Mike Kelly, Tom Ernst, and their crew in the impound area. Under the leadership of Lars Ericsson, the scoring was handled by Valeta Glover, Cindy Ericcson, Missy Banko, and Dana Kelly. I want to point out here, that a contest of this size does not just happen, but takes the willing labor of many to make it come together for a well run contest. I only mention these names, because their extra effort helped make it all happen. We also had considerable help from the MASS club members from Memphis on the winch line or wherever help was needed.

The winch line consisted of four BAT winches and four identical, David Godfrey designed and manufactured, high speed retrievers. A fifth Rahn winch and retriever was on the line as backup. This equipment worked well throughout the contest, as can be seen by the duration of each day's flying to complete the five rounds. Six and one half hours for 525 launches is not bad; since that works out to a plane being launched every one and one half minutes on the average. Five modified L-4 landing spots were used both days, and it appeared this worked fairly well. In the future it has been suggested that a landing judge be used to assure that there are no mix-ups on who has the landing privilege at a given spot.

When the dust had settled at the conclusion of Saturday's event, the fifteen top finishers were as follows:

1	Bob Sowder	4949	
2	Scott Meader	4922	*
3	Mark Hoffman	4921	
4	Herry Bostick	4920	
5	Nelson Itterly	4914	
6	Richard Tiltman	4888	*
7	Fred Rettig (Cornfed)	4884	*
8	Art Frost	4857	*
9	Kendall McDonald	4854	
10	Rich Spicer	4835	*
11	Jay Schultz	4831	
12	Jim Thomas	4829	
13	Brian Smith	4821	
14	Gerald Zeigenfuse	4816	
15	Russ Behr	4798	

(L) Mark Hoffman, 3rd Expert, Saturday
(R) Nelson Itterly, 5th Expert, Saturday

Michael Wilson, 1st place Junior.

As can be seen by these scores, the competition was pretty tough, since a perfect score was 5000. While these scores were being totaled, the drawings were held for the distribution of the raffle prizes which had been donated by the following individuals:

Slegers International (Ed Slegers) Vision Radio, Prism & Vulcan Sailplanes

Henry Bostick (R), 4th Expert, Saturday
Ed Slegers, (L)

Faithful Scorers, (L - R)
Cindy Ericsson, Dana Kelly, Missy Banko, Valeta Glover.
They posted over 400 scores for 2 days!

Airtronics (Tim Renaud) Thermal Eagle Sailplane & 50% Discount Coupon
RnR Products (Rich Spicer & Richard Tiltman) Genesis Sailplane
Viking Models (Jerry Slates) Stiletto Fiberglass Fuselage
Tekoa (Rodger Chastine) Two Meter Pre-sheeted Wing
Hobby Shack Giglo Sailplane & 5 Gift Bags
Peck Polymers Genesis Handlaunch Sailplane
RC Airfoils (Chuck Anderson) Deluxe Airfoil Plotting Software

Again, our two host clubs, NASF and MASS can not begin to express our appreciation to all the contributors who have helped make this contest become one of the major contests in the country. In addition to the above listed major contributors, the following gave donations that were distributed by claim ticket to all the registered pilots attending the contest: Horizon Hobby, Futaba, Aerospace Composite Products, Kalmbach Publishing, Du Bro Products, Soaring Specialties, B&P Products, Sullivan Products, Hunt Man., Tower Hobbies, Rocket City Specialties, Sheldons Hobbies, Fiberlay, KOP Coat/Hobby Poxy, *Quite Flight Intrn.*, *Model Airplane News*, Pony Express/Dave Thornburg, B^2 Streamlines, Pierce Arrow, *R/C Report*, SR Batteries, Hobby Lobby, Coverite, Lone Star Models, SIG, Dave's Wood Products, Satellite City, Balsa USA, Northeast Screen Graphics, and *R/C Modeler* Magazine.

A typical afternoon storm moved through the area right at the end of the raffle drawing, which prevented the planned fly-off of the top ten scores for RnR's donated Genesis sailplane. The fly-off was rescheduled for the following day at the end of Sunday's flying. Because RnR indicated that they would not fly for their donated prize (nice gesture on their part), and two additional flyers could not be there

Hand Launch Junior winners (R - L):
Chuck Thomas (1st) Michael Wilson (2nd)

on Sunday, the flyers listed, less the * indicated scores, flew a seven minute duration round plus landing on Sunday after the completion of the thermal event. As during the contest, the flight time was worth 900 points, with a perfect landing worth an additional 100 points. Because of a frequency conflict, the ten flyers were divided into two groups of five, with a coin flip deciding who went first. Three winches were used, and the first five flyers were in the air within 45 seconds. Two of the first group made their times. The second group was flown in the same fashion as the first, with four of this group getting their times. Brian Smith won with a 7:01/95, Henry Bostick, was next with a 7:02/95, while Jay Schultz was third with a 7:03/90. That's about as close as you can get! Great flying guys, and as a result, this event really held the crowd's interest, with several individuals timing different flights to check on how well their favorite was doing.

Sunday's weather, once again, was near perfect, with 82 flyers towing the line. Mike Kelly (Sunday's CD) got the group organized quickly, and the flying got under way by 9:15. This event was similar to Saturday's, but with the times being 4,6,6,8,8. The five rounds were completed by 2:20, and while the scoring was being totaled, the above described fly-off was held. The final tallies for Sunday's event were as follows:

1	Brian Smith	4917
2	Kendall McDonald	4893
3	Ted Nickson	4888
4	Jim Thomas	4876
5	Mark Thomas	4874
6	Rich Spicer	4848
7	Lee Montgomery	4831
8	Jay Schultz	4831
9	Gerald Zeigenfuse	4823
10	Herry Bostick	4809

Once again, as can be seen by this list, the scores were really close. This may have been the highest level of competition the MSSC's had to date, with only 8 points separating 5th place from 2nd on Saturday, and only 19 points separating 5th place from 2nd place on Sunday. The High-Over-All winner for the two days of thermal competition was Kendall McDonald of Tullahoma, Tennessee, flying a Sailaire, with a

Top five Hand Launch (L - R)
Wayne Langford (4th), Charles Baltzer (1st), Randy Chronic (2nd), Bob Massman (5th), Jim Thomas (3rd)

Fourth Annual Mid South Soaring Championships Summary

Thermal Duration: Sat 6-17-95 Sun 6-18-95

Expert			
1 Bob Sowder	4949	Brian Smith	4917
2 Scott Meader	4922	Kendall Mcdonald	4893
3 Mark Hoffman	4921	Ted Nickson	4888
4 Henry Bostick	4920	Jim Thomas	4876
5 Nelson Itterly	4914	Mark Thomas	4874
Sportsman			
1 Richard Weider	4758	Trey Finney	4837
2 Trey Wood	4700	Richard Weidner	4748
3 Mark Barbee	4669	Scott Hunt	4716
4 Steve Addison	4586	Steve Addison	4715
Novice			
1 Don Cleveland	4353	Sam Woodard	4558
2 David Badger	4217	Don Cleveland	4520
3 Greg Finney	4077	Terry Alexander	4457
Junior			
1 Michael Wilson	4075	Michael Wilson	4657
2 Ross Godfrey	2974		
3 Aaron Badger	1624		

High-Over Champion - Thermal Duration
Kendall McDonald 9747 Out Of 10,000

Fly-Off Winner From Sat's Top Ten Scores - Brian Smith

Hand Launch			Cross Country
Open			
1 Charles Baltzer	4510	1 Scott Meader	SBXC
2 Randall Chronic	4452	2 Rich Tiltman	SBXC
3 Jim Thomas	4424	3 Pat Flinn	Catalina
		4 Cliff Smith	SBXC
Junior			
1 Chuck Thomas	1928		
2 Micheal Wilson	1540		

Brian Smith (L), winner of Saturday's fly off. Richard Tiltman (R) presenting RnR Genesis.

Thank You!
The Mid-South gang does it again!!
Great Sponsors!
Great Site!
Great Equipment!
Great Weather!
Great Food!
Great Fellowship!
See you in '96!

Brian Smith,
Tullahoma, Tennessee

score of 9,747 out of 10,000. Guess the high Tech planes don't always get the hardware. Note that Brian Smith was 2nd over-all, only 9 points back, and Henry Bostick was 3rd, only 18 points behind Kendall. This is the first time the High-Over-All Champion has stayed in the south, as the two previous winners were from California. A special thanks to Russ Behr for all the great photographs that were taken throughout the four days of this event. Several of these have been included for your readers viewing.

The trophy list for the entire contest is shown by the following summary, and as noted here, the MSSC's award format has always been an attempt to make this contest as fair as possible for all levels of competition, from the expert class down to the beginning novice. This appears to have worked fairly well, as once again this year we had a great showing of sportsman and novice flyers. Of the 105 in attendance on Saturday, there were 67 in expert class, 22 in sportsman, 12 in novice, and 4 juniors. I personally want to encourage all levels of competition to attend this event next year in Memphis, Tennessee. **It will be held June 20 - 23.** ■

Winning Team, Cross Country Scotty Meader "1st", Richard Tiltman (R) "2nd" Returning to staging area.

Rich Spicer (L) & Lars Ericsson (R) of RnR Team. Doing serious repairs on internal gear of Cross Country ship.

Mark Barbee with Cross Country entry, Own Design & construction, 150" wing span, high tech full house design.

Photo taken during 1995 Mid-South event. Ross Godfrey and Bob Champine recycling winch line. Rob Glover photo.

1995 Mid-South Cross Country Event

by Rob Glover
Huntsville, Alabama

We Did It! We even had a race!

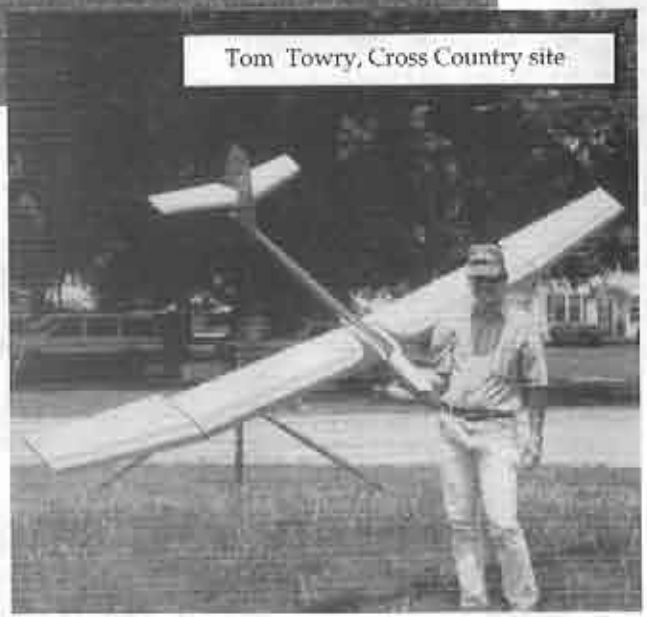
For those of you who have never had the pleasure of attending or competing in a cross country race, I will try to explain a little about this peculiar form of madness. I will also try and let you know how our race turned out.

The weather for our event turned out to be pretty much prefect this year. Those of us who tried to race last years Mid-South cross country event remember how humbling marginal weather can be. It can be an otherwise beautiful day, but if the lift isn't building to 5,000 ft. or so, you will wind up wishing that you were somewhere else. The lift started building around 11:00, and the course stayed hot well into the afternoon on both days of our event this year.

The race course consisted of an 18 mile loop on county roads west of Huntsville, Alabama. All roads were paved and had minimal traffic. Our start point was at Auburn University's agricultural experiment station near Bell Mina, Alabama. We had a good field to launch from, an on site weather station, conference room, rest rooms, coke and candy machines, and big oak trees for shade. We all owe Auburn a big "Thank You"!

Pat Flinn, 3rd place, Cross Country

Bovine Cow Team, 4th place, Cross Country.
Cliff Smith (L) with David Godfrey.



Tom Towry, Cross Country site

The event rules are simple. You launch your plane whenever you want, as often as you want. There were 11 teams entered, and every team had its own frequency assigned so there was never any waiting to fly. After launching, you can thermal up and fly the plane out onto the course however you like. When you feel ready, climb into the team vehicle (a pick up truck or convertible). You must also have a driver, and official timer. When the vehicle enters the course, the time is started. You fly around the course, thermaling back up as needed, and the time stops when both the plane and the vehicle complete the course. No relaunches are allowed on the course. If you land "out", load it up and come back to try again. The event rules are simple; it is an easy event to run, and very challenging to fly.

Most of the competitors arrived with some team support already arranged. Several of our local club members volunteered time and vehicles to aid out-of-towners. Nobody wound up shorthanded for drivers, co-pilots, or timers. This event is really a lot of fun to participate in as a team member.

As stated earlier, the lift was great, so we had 7 completed runs, by 5 different pilots. Finishing a run is a thrill for everybody concerned, pilots and crew alike. Not finishing a run can be an even bigger thrill, sometimes resulting in the loss of an airplane. There were an abundance of open places to land scattered around the course, but some pilots chose to crash in hard to reach areas for entertainment.

Pilot Name	Home Port/ Team	Time/miles completed	Type of plane
Scott Meader	San Jose, CA/ RnR Products/ Atomic Fireball 2	28:25	SBXC
Pat Flinn	Dearborn, MI/ Pat & Mike	31:00	Catalina
Rich Tillman	San Jose, CA/ RnR Products/ Atomic Fireball 2	35:26	SBXC
Pat Flinn	Dearborn, MI/ Pat & Mike	36:59	Catalina
Cliff Smith	Athens, AL/ Southeastern Bovine XC Racing Team	41:00	SBXC
Cliff Smith		46.59	
Lee Montgomery	W. Palm Beach, FL	1:16:04	Own Design
Lee Montgomery		12.7 mi.	
Rich Spicer	San Jose, CA/ RnR Products/ Atomic Fireball 1	11.2 mi	SBXC
Rich Spicer		10.7 mi	
Harold Saunders	Huntsville, AL	10.2	SBXC
Tom Towry	Tullahoma, TN	9.0	Sailaire
Mark Barbee	Germantown, TN	1.1	own design
Lloyd Chandler	Houston, TX/ Lloyd*2	.5	Windsong
Bob Sowder	Cordova, TN	Best Crash by an LSF level 5	SBXC

Several pilots made a tactical error when they cut the wrong corners. This tactic is quite legal, but not quite always smart. Sometimes this put a tree line between the pilot and his bird, making it difficult to steer. Last I heard, Bob Sowder still hadn't found his SBXC. Several people said that they heard it hit from more than a mile away; may not be much left above ground.

Joe - Pat Flinn found the value of having his name, address, and phone # on his plane. (Most of you know him as plain old Pat, but his first name is really Joseph, and in Alabama we don't let a Joe go silent.) He had lost his Catalina, only to have a message from his wife back in Michigan waiting for him when he got back to his motel room that evening. It seems that a local farmer had seen the bird go in, picked up the pieces and called the number immediately. Pat got everything back that night except for the thermal sniffler. It had been thrown clear of the airplane, and when Pat inquired as to its whereabouts the farmer went back out to the divot in the field and found it for him!

I was also happy to be able to sign off a few LSF cross country tasks for folks that needed them. Both days were productive from this standpoint. The course itself didn't qualify for level 5 (it was a good level 4); but it was a good level 5 if you wanted to stretch out off the ends of the race course.

Near as I can tell, we had about the biggest cross country event in the Eastern U.S., which is sort of scary when I think about it. Beginners luck, good weather, and a lot of help from both club members and competitors, all combined to make things go smoothly. There seems to be growing interest in this foolishness, and a number of good ideas for future events were suggested by participants. I would be happy to serve as a contact point for the exchange of information about cross country events, gossip, and technical ideas. If you want to add something to the discussions drop me a line. We can probably prevail on Jerry and Judy to publish a few lines if interest warrants.

I have appended a spreadsheet with as much info as I have about the contest results and hardware. ■

Classified Advertising Policy

Classified ads are free of charge to subscribers provided the ad is personal in nature and does not refer to a business enterprise. Classified ads that refer to a business enterprise are charged $5.00 per month and are limited to a maximum of 40 words. The deadline for receiving advertising material is the 5th day of the month. (Example: If you wish to place an ad in the March issue, it must be received by February 5th.) *RCSD* has neither the facilities or the staff to investigate advertising claims. However, please notify *RCSD* if any misrepresentation occurs.

Personal ads are run for one month and are then deleted automatically. However, if you have items that might be hard to sell, you may run the ad for two months consecutively.

For Sale - Business

GLIDER RETRACTS - high quality, 1/5, 1/4, 1/3 scale made in U.S.A. 1/4 are standard or heavy duty. Contact Bill Liscomb, 7034 Fern Place, Carlsbad, CA 92009; (619) 931-1438.

PC-Soar Version 3.5 Sailplane Performance Evaluation Program Optional Sailplane Library now expanded to 54 models including: Alcyone, Anthem, Genesis, Mako, Probe, Thermal Eagle, and Synergy 91. Free Library Upgrades. PC-Soar Upgrade to Ver. 3.5 $10, PC-Soar New Purchase $40. New Libraries of Sailplanes and Airfoil Polars $30. Please include $3 P&H for all purchases & upgrades. Also available: *RCSD* Database and Laser cut airfoil templates. LJM Associates, 1300 Bay Ridge Rd., Appleton, WI 54915; ph: (414) 731-4848 after 5:30 pm weekdays or on weekends.

PRECISION AMAP WING CUTTER, replacement parts, and service. AMAP Model Products, 2943 Broadway, Oakland, CA 94611. Butch Hollidge, (510) 451-6129, or FAX (510) 834-0349.

A.M.P. Aerial Model Products, sport, slope, race prototypes - all airfoils. 60" Del Valle Snake, 94" H&K Cobra, AMAP Flair, Kevin Cutler's full house Davenport Monitor. All race tested. Butch Hollidge, (510) 680-0589, eve, California.

WANTED: Sales Reps. Just Plane Fun Models is looking for energetic people who love flying R/C sailplanes and would like to support their hobby by becoming a sales representative for my line of sailplane kits. Be your own boss and set up your own territory. Call or write Buzz Waltz, Just Plane Fun Models, 3390 Paseo Barbara, Palm Springs, CA 92262; (619) 327-1775. Commissions paid on all sales.

FORD LONG SHAFT MOTORS, $75. Classic glider kits, cool bands. HITEC, FUTABA, AIRTRONICS radios. #2 meter zip starts: $24.95. Call us for your glider needs. 1-800-359-0233. Ask for Scott. 10AM - 4PM MTN time.

For Sale - Personal

Multiplex LS-3, RTF, 4 Futaba servos, no rec battery or rec., excellent condition... $550.00 plus freight; NIB, Bob Dodgson Lovesong... $175.00 or OBO plus freight. Harry, (509) 525-7066, after 5:30 pm, PST, or anytime to leave a message, Washington.

Ace Micro Pro 8000, dual stick with an extra RF deck... $300.00. Henry, (615) 967-6890, Tennessee.

T-tail Prism, no gear, flown 12 - 15 times, RG-15... $350.00 + S&H; 2m Sagitta, flown 5 - 6 times, w/Futaba Tx + r + all servos + rec'r...$175.00 + S&H; Brian Agnew V-tail hand launch, never broken... best offer. Leigh Hodgdon, (415) 858-3582 (day), (408) 243-7250 (eve), California.

HELP! Getting married, need cash! Original Synergy III with 6 Airtronics servos, excellent slope racer or first F3B ship...$390.00 or $225.00 without servos; Synergy 91 wings and tail with custom (IL) Eagle fuselage (like an Eagle, but 3" longer and 1/4" wider), all components in excellent condition, includes 5/8" rectangular carbon joiner, 4 Airtronics 141 servos in wings... $475.00 for all or $385.00 for wings and stab, only. 1/5th scale Multiplex ASW-22 with Alpina magic wings, beautiful model, 100% air ready, flies great, includes 9 Airtronics servos, Graupner retract, custom wing bags, plug-in wing tips for standard 13' or 15'4" scale wing-span option... will sell with everything for $650.00. Steve Condon, (619) 630-2909 (H), (619) 594-7823 (W), California.

Mako w/HQ 2.5/10 - 3/9 wing, 114" span, great flying plane... $350.00 + S&H; Genesis, great condition... $295.00 + S&H; Stiletto I w/HQ 2.5/9 wing, 108" span, needs paint and radio... $350.00 + S&H. Dale, (214) 475-8093, Texas.

Falcon 880 electric sailplane, FX-35 speed control w/BEC, Astro 15 w/9x5 folding prop, spare 880 glider fuselage, 12 - 1000 mah cells, 6 servos, 88 oz. flying weight... $525.00; Anthem sailplane, 132" wingspan, 6 servos, SR battery pack... $325.00. Ken Mosca, (516) 487-6014, New York.

Model Builder magazine, complete set, Vol. 1, #1 through 1994, plus extra copy of Vol. 1, #2 & #3. Please make offer. Will sell to highest bid received by December 15, 1995. Paul Strona, (808) 373-9509, 245 Panio St., Honolulu, HI 96821.

Larry Jolly Model Products Comet XC fuselage with canopy and servo tray, brand new, never flown... $120.00 includes ship.; Viking Models 1/5 scale ASW 17 fuselage with canopy, tray, plans, drawing... $75.00 includes ship.; SI Spectrum 2m, RTF, 7037 airfoil, includes 2 S33's on ailerons, never crashed... $150.00 includes ship. Wanted or will trade for 1/4 scale Salto fuse, prefer Viking Models. Ed Lightcap, (412) 828-5905, 3pm - 9pm, EST weekdays/anytime week-ends, Pennsylvania.

Airtronics Infinity 1000, ch 54, complete with extra 1100 mah Tx battery, 10 ch PCM Rx, new 700 mah Rx battery, 5-94102 servos, charger, as much of the manual as Airtronics has recieved... $900.00. NIB kits: Weston Magic, bagged wings and V's, 9% airfoil... $320.00; 2m Mariah... $100.00; Multiplex Schaumpus (3 or 3.5m)... $375.00; RTF Astro Charger with geared 05, Futaba 4 ch Tx w/4 Rx/motor controllers, 1 extra 4 ch reciever... $275.00. Shipping on all items extra. Jim Thomas, (206) 488-2524, Washington.

NIB, Ace Quasoar, can be built with 99" or 123" span, full-house or rudder/elev/flaps, fiberglass fuse, balsa sheeted foam wings. Asking $119.00 + shipping. Steve Marano, (201) 284-0158, New Jersey.

NIB kits: NSP Sparrow, 67" V-tail w/pre-sheeted obeche wings & f.g./kevlar fuse... $95.00; Air Quest Zuni, 60" V-tail wingeron glider w/plywood pod & carbon fiber boom fuse (uses 2 standard servos)... $55.00; Airtronics Sagitta 600, 2m classic glicer w/built-up wing & fuse... $75.00. Adam, (415) 199-5647, California.

SIG Samuri, pivot wing sloper, wings bagged with 1/64" ply & carbon reinforced, new high power coreless servos, white fuselage, red wings & tail, Rx battery included, extremely clean, flight tested. Gordy, (502) 592-2923, Kentucky.

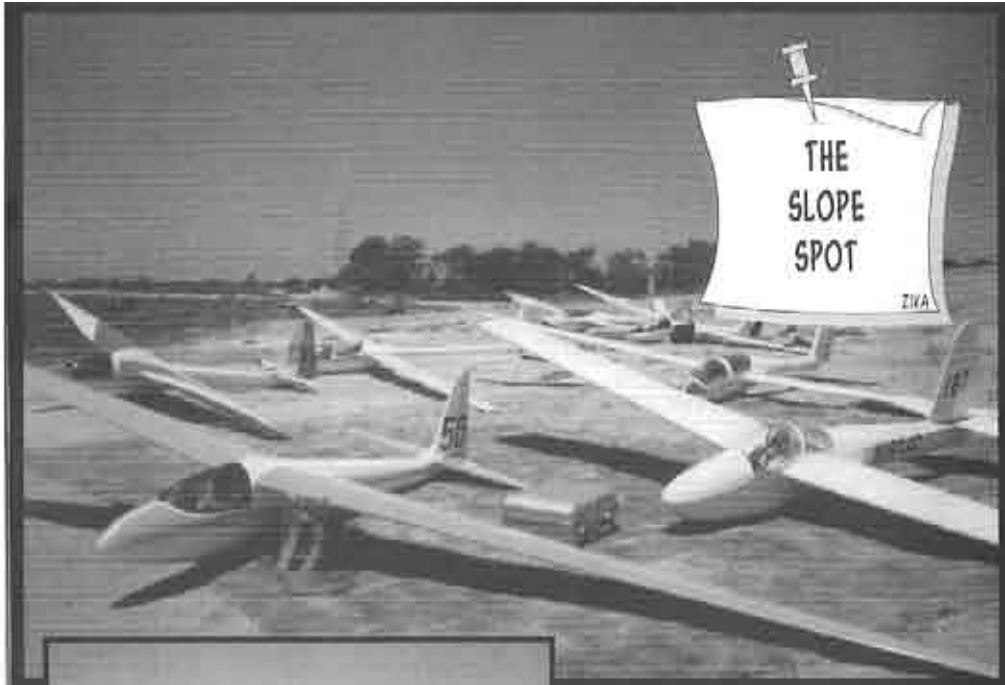
1/3 Club Libelle (Krause), 5 meter span with servos rigged for Futaba with nose release, absolutely ready to fly... $895.00; Twin Astir (Wik), 4 meter all glass, excellent condition, completely finished, ready to fly, slight hangar rash, has an immaculate detailed twin cockpit, competition worthy, all servos rigged for Futaba radio, nose tow release for airtowing... $795.00; Thermoflug all glass 4 meter Salto with Futaba servos, slight hangar rash, absolutely ready to fly... $595.00; 6 meter Nimbus 2 with flaps, spoilers, airtow and all servos, ready to fly, mint condition... $1500.00; Wik Speed Astir (Robers), all glass, NIB, 3.8 meters... $595.00; Twin Aero III, NIB, 4 meters... $495.00; huge towplane, 134" span, will tow the largest sailplanes, 1/3 1.5 with Saks 8.4 twin and Futaba servos, mint condition... $2500.00; Graupner Electric UHU plus Graupner direct drive speed 600 motor plus on and off switch plus two Sanyo batteries plus Aristocraft AC/DC multicharger... all for $395.00. Robin Lehman, (212) 879-1634, New York.

Robbe ASW 24, 3.5 meter wing span (foam with balsa), new, never flown, 80% of building completed (eg., air-brakes installed and wings covered). Make me a fair offer. Call Cameron at (217) 333-2037 [w], (217) 344-4342 [h], Illinois.

Multiplex Fiesta, RTF, w/servos... $175.00; Skyhawk, wings & tail covered... $300.00; Pixy, partially assembled... $100.00; NSP Symphony electric, all new, completely RTF, w/servos & motor, prop, ESC... $750.00; Shadow wings... $125.00; Talon kit... $20.00; Cumic fuselage... $50.00; Banshee, fuse primed, wings RTC... $200.00; Gemini MTS kit... $40.00; F3B package, 2 Synergys, Nova, shipping container & 4 winding winch w/3 ball bearings, Airtronics radio components w/SR batteries... $2000.00; 6 Tina servos, NIB... $20.00 ea.; Astro Cobalt 15 w/prop, 10 cell battery & on/off brake... $100.00; RnR Genesis, NIB... $350.00; NIB Original Hobie Alter Hobie Hawk, brand new including original shipping container, original blue box & decal, a real collector's item... $300.00; Key Publisher, DTP sofeware w/books... $30.00; ModelCad w/books... $50.00. George Voss, 1403 Lincolnshire Rd., OKC, OK 73159; (405) 692-1122.

Wanted

Lorus or Seiko countdown stopwatch in good condition for use in F3B and other soaring activities. If you have one you would sell at a fair price, please call Steve Condon at (619) 630-2909 (H), (619) 594-7823, California.



Scale Sailplane Photos

...from Mark Foster
South Pasadena, California

Another day's roll-up at Torrey Pines.

The latest in scale RC soaring hat wear!

After stepping in a gopher hole and spraining my ankle, I was still able to save the Salto!
...Mark Foster

Special Interest Groups & Contacts

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 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.

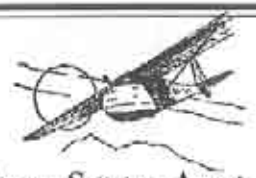
Reference Material

"Summary of Low-Speed Airfoil Data - Volume 1", Michael Selig wind tunnel testing results. $25 USA (includes postage), $29 surface outside USA, $31 air Western Hemisphere, $38 air Europe, $42 air all other countries. Computer disk, ascii text files (no narrative or illustrations), is $15 in USA; $16 outside USA. Source for all "SoarTech" publications, also. Contact Herk Stokely, 1504 N. Horseshoe Cir., Virginia Beach, VA 23451. Phone (804) 428-8062, email: herkstok@aol.com.

Still a few copies available of some issues of the printed transcripts of talks given on RC Soaring at the Previous Annual National Sailplane Symposium. Prices reduced to clear out stock. Talks were on thermal meteorology, flying techniques, hand launch, cross country, plane design, airfoil selection, vacuum bagging, plastic coverings, flying wings, etc., etc. Send SASE or call for flyer giving details. Many copies of most recent (1992) transcript left. Clubs have found them good for raffle prizes, gifts, etc. Al Scidmore, 5013 Dorsett Drive, Madison, WI 53711; (608) 271-5500.

Seminars & Workshops

Free instruction for beginners on construction & flight techniques, Friday & week-ends (Excl. contest days), Bob Pairman, 3274 Kathleen St., San Jose, CA 95124; (408) 377-2115.



The Vintage Sailplane Association

Soaring from the past and 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. VSA publishes the quarterly BUNGEE CORD newsletter. Sample issue: $1.00. Membership is $15.00 per year. For more information, write to the:

Vintage Sailplane Association
Route 1, Box 239
Lovettsville, VA 22080

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 $18.00 (US) or $22.00 (Foreign) per year for twelve issues.

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

LSF

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.

League of Silent Flight
10173 St. Joe Rd.
Ft. Wayne, IN 46835

R/C Soaring Resources

These contacts have volunteered to answer questions on soaring sites or contests in their area.

Contacts & Soaring Groups - U.S.A.

Alabama - North Alabama Silent Flyers, Ron Swinehart, 8733 Edgehill Dr. SE, Huntsville, AL 35802; (205) 883-7831.

Arizona - Central Arizona Soaring League, Iain Glithero, (602) 839-1733.

Arizona - Southern Arizona Glider Enthusiasts, Bill Melcher (contact), 14260 N. Silwind Way, Tucson, AZ 85737; (602) 325-2729. SAGE welcomes all level of flyers!

California - California Slope Racers, John Dvorak, 1063 Glen Echo Ave., San Jose, CA 95125; (408) 259-4205.

California - Desert Union of Sailplane Thermalists, Buzz Waltz, 3390 Paseo Barbara RD, Palm Springs, CA 92262; (619) 327-1775.

California - Northern California Soaring League, Mike Clancy (President), 2018 El Dorado Ct, Novato, CA 94947; (415) 897-2917.

California - South Bay Soaring Society, Mike Gervais, P.O. Box 2012, Sunnyvale, CA 94087; (408) 683-4140 after 5:00 pm.

California - Southern Calif. Electric Flyers, John Raley (President), 1375 Logan Ave., Costa Mesa, CA 92626; (714) 641-1776 (D), (714) 962-4961 (E), e-mail: E-Flyer@ix.netcom.com.

California - Torrey Pines Gulls, Ron Scharck, 7319 Olivetas Ave., La Jolla, CA 92037; (619) 454-4900.

Eastern Soaring League (VA, MD, DE, PA, NJ, NY, CT, RI, MA), Jack Cash (President), (301) 898-3297, e-mail BadIdeas@aol.com; Bill Miller (Sec./Tres.), (609) 989-7991, e-mail JerseyBill@aol.com; Michael Lachowski (Editor), 448 County Rt 579, Milford, NJ 08848, e-mail mikel@airage.com.

Florida - Florida Soaring Society, Ray Alonzo (President), 3903 Blue Maidencane Pl., Valrico, Fl. 33594; (813) 654-3075 H, (813) 681-1122 W.

Georgia - North Atlanta Soaring Association, Tim Foster, (404) 978-9498 or Tom Long, (404) 449-1968 (anytime).

Hawaii - Maui Island Slope Soaring Operation, MISO, Hank Vendiola, 10-C Al St., Makawao Maui, HI 96768.

Illinois (Chicago Area) - Silent Order of Aeromodeling by Radio (S.O.A.R.), Jim McIntyre (contact), 23546 W. Fern St., Plainfield, IL 60544-2324; (815) 436-2744. Bill Christian (contact), 1604 N. Chestnut Ave., Arlington Heights, IL 60004; (708) 259-4617.

Illinois (Northwest) - Valley Hawks R/C Soaring Club, Jeff Kennedy (President), 414 Webster St., Algonquin, IL 60102, (708) 658-0755, eve. or msg.

Iowa - Eastern Iowa Soaring Society (Iowa, Illinois, Wisconsin, Minnesota), Bob Baker (Editor), 1408 62nd St., Des Moines, IA 50311; (515) 277-5258.

Indiana - Bob Steele, 10173 ST Joe Rd., Fort Wayne, IN 46835; (219) 485-1145.

Kansas - Wichita Area Soaring Association, Pat McCleave (Contact), 11621 Nantucket, Wichita, KS 67212; (316) 721-5647.

Kentucky - Bluegrass Soaring Society, Frank Foster (President), 4939 Hartland Pkwy., Lexington, KY 40515; (606) 273-1817.

Maine - DownEast Soaring Club (New England area), Steve Savoie (Contact), RR#3 Box 569, Gorham, ME 04038; (207) 929-6639. InterNet e-mail <Jim.Armstrong@acornbbs.com>.

Maryland - Baltimore Area Soaring Society, Russell Bennett (President), 30 Maple Ave., Baltimore, MD 21228; (410)744-2093.

Maryland and Northern Virginia - Capital Area Soaring Association (MD, DC, and Northern VA), Steven Lorentz (Coordinator), 12504 Circle Drive, Rockville, MD 20850; (301) 845-4386.

Michigan - Great Lakes 1.5m R/C Soaring League & "Wings" Flight Achievement Program & Instruction. Ray Hayes, 58030 Cyrenus Lane, Washington, MI 48094; (810) 781-7018.

Minnesota - Minnesota R/C Soaring Society, Tom Rent (Contact), 17540 Kodiak Ave., Lakeville, MN 55044; (612) 435-2792.

Missouri - Independence Soaring Club (Kansas City area, Western Missouri), Edwin Ley (Contact), 12904 E 36 Terrace, Independence, MO 64055; (813) 833-1553, eve.

Nebraska - B.F.P.L. Slopers, Steve Loudon (contact), RR2 Box 149 E1, Lexington, NE 68850; (308) 324-3451/5139.

Nebraska - S.W.I.F.T., Christopher Knowles (contact), 12821 Jackson St., Omaha, NE 68154-2934; (402) 330-5335.

North Carolina - Aerotowing, Wayne Parrish, (919) 362-7150.

New York, aerotowing Long Island Area, Robin Lehman, (212) 744-0405.

New York, aerotowing Rochester area, Jim Blum and Robin Lehman, (716) 367-2911.

New York - Long Island Silent Flyers, Stillwell Nature Preserve, Syosset, NY, Joe Coppola (President), (516) 798-1479, or Taylor Fiederlein (VP), (516) 922-1336.

Northwest Soaring Society (Oregon, Washington, Idaho, Montana, Alaska, British Columbia, Alberta), Roger Breedlove (Editor), 6680 S.W. Wisteria Pl, Beaverton, OR 97005; (503) 646-1695 (H) (503) 297-7691 (O).

Ohio - Dayton Area Thermal Soarers (D.A.R.T.S.), Walt Schmoll, 3513 Pobst Dr., Kettering, OH 45420, (513) 299-1758.

Ohio - Mid Ohio Soaring Society (MOSS), Hugh Rogers, 888 Kennet Ct., Columbus, OH 43220; (614) 451-5189, or e-mail tomnagel@freenet.columbus.oh.us.

Oklahoma - Central Oklahoma Soaring, George Voss, (405) 692-1122.

Tennessee - Memphis Area Soaring Society, Bob Sowder (contact), 1610 Saddle Glen Cove, Cordova, TN 38018, (901) 751-7252, FAX (901) 758-1842.

Tennessee - South Central Area, Brian Smith, 317 Crestwood Dr., Tullahoma, TN 37388, (615) 393-4876, anytime.

Texas - Texas Soaring Conference (Texas, Oklahoma, New Mexico, Louisiana, Arkansas), Gordon Jones, 214 Sunflower Drive, Garland, Tx 75041; (214) 271-5334.

Utah - Intermountain Silent Flyers, Bob Harman, (801) 571-6406. "Come Fly With Us!"

Virginia - Tidewater Model Soaring Society, Herk Stokely, (804) 428-8062, email: herkstok@aol.com.

Washington - Seattle Area Soaring Society, Waid Reynolds (Editor), 12448 83rd Avenue South, Seattle, WA 98178; (206) 772-0291.

Outside U.S.A.

Australia - Southern Soaring League, Inc. (SSL), Mike O'Reilly, Model Flight, 42 Maple Ave., Keswick SA 5035, Australia. Phones: ISD+(08) 293-3674, ISD+(08) 297-7349, ISD+(018) 082-156 (Mobile). FAX: ISD+(08) 371-0659.

Canada - Manitoba, Winnipeg MAAC Men Gliding Club, Bob Clare, 177 Tait Ave., Winnipeg, MB, R2V 0K4, Canada, (204) 334-0248.

Canada - Southern Ontario Glider Group, "Wings" Program, dedicated instructors, Fred Freeman, (416) 627-9090, or David Woodhouse (519) 821-4346.

England (BARCS & Europe), Jack Sile (Editor), 21 Bures Close, Stowmarket, Suffolk, IP14 2PL, England; Tele. # 0449-675190.

Hong Kong - Robert Yan, 90 Robinson Road, 4th Floor, Hong Kong; (852) 25228083, FAX (852) 28450497.

Scotland - Ron Russell, 25 Napier Place, South Parks, Glenrothes, Fife, Scotland KY6 1DX; Tele. # 01592 753689.

BBS/Internet

BBS: SLOPETECH, Southern California; (714) 525-7932, 14.4 baud - 8-N-1

BBS: South Bay Soaring Society, Northern California; (408) 281-4895, 8-N-1

Internet - Email list/resource of RC soaring related folks, including US and international club contacts, vendors, kit manufacturers/distributors, software, equipment and supplies. Also a resource for aeromodelling related WEB sites on the Internet. Contact Manny Tau at taucom@kaiwan.com, or on CompuServe: 73617,1731.

Hobby Shops that Carry *RCSD*

Air Capital Hobbies
8989 West Central
Wichita, KS 67212
(316) 721-4164

California Soaring Products
1010 North Citrus
Covina, CA 91722
(818) 966-7215

Finney's Hobbies
3455 Peachtree Industrial Blvd., Ste. 980
Duluth, GA 30136
(770) 495-8512
(770) 495-8513 fax

Gunnings Hobbies
550 San Anselmo Ave.
San Anselmo, CA 94960
(415) 454-3087

Gyro Hobbies
23052 Lake Forrest Dr., Unit C2
Laguna Hills, CA 92653
(714) 583-1775

HiTecHobbys
284 - B Wellsian Way
Richland, WA 99352
(509) 943-9241

Hobbies'N Stuff
9577 L Osuna Rd. NE
Albuquerque, NM 87111
(505) 293-1217

Hobby Counter
1909 Greenville Ave.
Dallas, TX 75206
(214) 823-0208

Hobby Town USA
8090 S. 84th St.
La Vista, NE 68128
(402) 597-1888

Hobby Warehouse
4118 South Street
Lakewood, CA 90712
(310) 531-8383

PEC'S Hobby Supplies
947 Stierlin Road
Mountain View, CA 94043
(415) 968-0800

Tim's Bike & Hobby
2507 Broadway
Everett, WA 98201
(206) 259-0912

Internet soaring mailing listserve linking hundreds of soaring pilots worldwide. Send a msg. containing just the word "subscribe" to soaring-request@airage.com. The "digestified" version that combines all the 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 mike@airage.com.

KRC 1995

The KRC electric meet was again held in the eastern Pennsylvania town of Quakertown and, as in the past, was excellent. The weather on Saturday, September 16th was great. Although I do not have any official figures, there were many more planes and pilots than last year. This event brings together just about every type of electric plane there is. Check the accompanying pictures of the KRC meet. If you fly electric or are interested in electric, the KRC is an event that you should try to get to.

Good Flying! ■

Gregg Voak came all the way from Australia.

Tim Hunt (L), Bob Aberle (R).

Adjustable pitched prop by Jerry Smartt.

Kirk Massey at New Creations RC booth. He came all the way from Texas.

Bob Vida, winner of raffle prize, all built and flown Puddlemaster with radio.

Philip Thayer of Flightec.

All up, last down (L - R)
Brad Baylor (1st), Doug Holland (2nd), Jerry Smartt (3rd), Ed Slegers (4th)

Dr. Keith Shaw with his electrics.

Aveox booth.

Special Events

Schedule of Special Events

Date	Event	Location	Contact
Oct. 15/18	Slope Soaring	Cape Cod	Alex Wenzl, (514) 984-7957
Oct. 21-22	Canyon Lake Classic	Canyon Lake, TX	Greg Dickerson, (210) 656-1796
2M, Open, HL - Potters Creek Park			Tom Meeks, (210) 590-3139
Oct. 21	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Oct. 22	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Oct. 22	SOAR Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
Oct. 29	One Design Contest	Orlando, FL	Rick Eckel, (407) 365-9757
Nov. 4-5	2m & Unl.	Morriston, FL	Ken Goodwin, (904) 528-3744
Nov. 4	TPG HLG Contest	Poway, CA	Art Markiewicz, (619) 753-3002
Nov. 5	TPG Fun-Fly & BBQ	Poway, CA	Steve Stricklett, (619) 741-1037
Nov. 5	SOAR Turkey Shoot	Plainfield, IL	See Illinois R/C Soaring Contacts
Nov. 11	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Nov. 12	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Nov. 12	Open	Dallas, TX	Chuck Fisher, (214) 270-2634
Nov. 19	Open	San Antonio, TX	Perry Van, (210) 658-8842
Nov. 24-26	22nd Tangerine	Orlando, FL	Ed White, (407) 321-1863
Dec. 9	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Dec. 10	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Dec. 9-10	Winter Soaring Festival	Indio, CA	Buzz Waltz, (619) 327-1775
1996			
June 8 - 9	SWSA 2M Soarfest '96	Southern CA	Pete Olsen, (909) 597-2095
June 20 - 23	Mid-South Championships	Memphis, TN	Bob Sowder, (901) 751-7252

New Products

NEW PRODUCTS

The information in this column has been derived from manufacturers press releases or other material submitted by a manufacturer about their product. The appearance of any product in this column does not constitute an endorsement of the product by the *R/C Soaring Digest*.

Spark 1 & 2

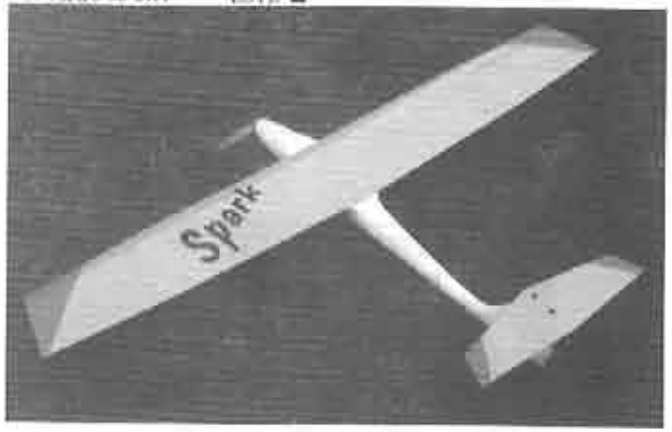
...from ICARE Sailplanes

The Spark electric motorglider comes in two versions. Spark 1 has a 53" span, intended as a fun/sport, fast climb sailplane when powered by 7 - 8 cells and an Astro 05 FAI. Model suited for aerobatic maneuvers. Specifications: 53" wingspan, 400 sq. in. wing area, E211 airfoil, 42 oz. weight, 15 oz./sq. ft. wing loading, 175.00 US + 15.00 S&H.

Spark 2 has a 71" span and is intended for thermal duration. A geared Astro 05 on 7 cells is recommended for long duration flights. Model capable of aerobatic maneuvers. Specifications: 71" wingspan, 535 sq. in. wing area, E211 airfoil, 46 oz. weight, 12 oz./sq. ft. wing loading, 187.00 US + 15.00 S&H.

Lightweight fiberglass fuselage has white finish and room for 10 cells. Two piece wings are fully built from foam core with internal fiberglass reinforcing, and obechi hardwood sheeting. Leading edges and tips in place, ailerons and cutouts fully faced, pre-cut aileron servo holes, pre-routed electrical wire. Wing is ready to cover. T-tail has to be built from balsa and is linked via a cable pushrod. Kits include hardware, building instructions and plans.

ICARE Sailplanes, Etienne Dorig, 381 Joseph-Huet, Boucherville, Quebec, J4B 2C5, Canada; (514) 449-9094 (5:00 PM - 10:00 PM EST). ■



Advertiser Index

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Now there are three locations to serve you better! Our sailplanes are available direct from us or from:
KENNEDY COMPOSITES, 15269 CR. 1227, Flint, TX 75762 • (903) 561-3924 • FAX (903) 561-3453
CALIFORNIA SOARING PRODUCTS, 1010 North Citrus, Covina, CA 91722 • (800) 520-SOAR • FAX (818) 966-7915

BARRACUDA

Designed by Brian Agnew

- Glass, reinforced with kevlar, fuselage accommodates standard servos
- Pre-sheeted wings & stabs
- Wing incorporates a poly break sheeted with one piece of obechi without a seam
- Full flying stabs
- Pre-routed flap & aileron and servo holes

Kit includes: full instructions, Squires wing rod, Byron Blakeslee control cables, Ziegelmeyer control horns and tow hook. All wood and hardware is of highest quality available.

Specifications

Wing Span	110"
Airfoil	SD7080
Weight	59-61 oz.
Price	$395.00

VULCAN 2M

Designed by Mark Allen

V-tail

Vucanistics:

Wing Span	78.73"
Weight	33 - 38 oz.
Airfoil (8 1/2%)	S7012
Wing Area	556.55 sq. in.
Wing Loading	9.25 oz./sq. ft.
Aspect Ratio	11.13:1
Average Wing Chord	7.07"
Price	$239.00

Pre-sheeted wings
Epoxy, high tek fuselage

SPECTRUM OPEN & 2M

SLIP ON NOSE CONE
PRE-SHEETED WINGS AND STAB
KEVLAR REINFORCED FUSELAGE
PRE-CUT AILERONS, FLAPS, AND ELEVATOR
Wings and stab have control surface capping material installed prior to sheeting, which provides additional strength for the control surfaces.

Specifications	Spectrum Open	Spectrum 2M
Wing Span	104"	78.5"
Wing Area	855 sq. in.	554 sq. in.
Airfoil	SD7037/RG-15	SD7037
Aspect Ratio	13:1	11.2:1
Weight	60 oz.	40 - 43 oz.
Wing Loading	10 oz/sq. ft.	10 oz/sq. ft.
Price	$359.00	$259.00

ELECTRIC HAWK

Designed by Mark Allen

Sky Hawk

Sky Hawk Attributes

- ✓ High aspect ratio wing
- ✓ "Swift" wing tip technology
- ✓ Thin airfoils at the wing tip
- ✓ Large control surfaces
- ✓ Large tail surfaces
- ✓ Long tail moment
- ✓ Exceptional performance
- ✓ Sleek lines and good looks
- ✓ Easy to handle
- ✓ Lots of room for radio gear

Wing Span:	74 in
Wing Area:	510 sq in
Airfoil:	SD7037
Price:	$229.00

Sky Hawk kit features a kevlar - carbon reinforced, fiberglass fuselage with carbon reinforced obechi - foam, pre-sheeted wings. A unique direct drive elevator servo is installed in the vertical fin.

Fiberglass fuselage reinforced with Kevlar
Pre-sheeted wings and stab
Double taper planform
7 - 10 cell electric

NIGHTHAWK

Designed by Mark Allen

Wing Span:	60 in
Wing Area:	370 sq in
Airfoil:	RG15
Price:	$195.00

Designed by Mark Allen

The design features a slightly longer fuselage and larger stab for high speed stability and to provide better energy retention through turns and aerobatics.
Fiberglass fuselage
Pre-sheeted wings

Specifications

Wing Span	110"
Weight	58 - 65 oz.
Airfoil - Root	SD 7037 or S7012
Airfoil - Tip	SD 7037 or S7012 - 8%
Wing Area	900 sq. in.
Wing Loading	9.5 - 10.5 oz./sq. ft.
Aspect Ratio	15:1
Price	$359.00

(Prices do not include S&H or New Jersey resident sales tax.)

High Quality Electric & Non-Electric Sailplanes, Radios, and Accessories for the Sailplane Enthusiast

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PRE-SHEETED WINGS AND STAB
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ROUTED HINGE LINE W/PLYWOOD ROOT RIB PRE-INSTALLED
FIBERGLASS W/CARBON FIBER KEVLAR REINFORCED FUSELAGE
SLIP ON NOSE CONE
3/8" TITANIUM WING ROD
COMPLETE INSTRUCTIONS & HARDWARE

Specifications V-Tail & Standard	
Wing Span	117"
Wing Area	910 sq. in.
Stab Area	102 sq. in.
Airfoil	SD7037
Aspect Ratio	15:1
Weight	60-65 oz.
Wing Loading	9.8 - 10.5 oz/sq. ft.
Price	$359.00

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