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



R/C *Radio controlled* SOARING DIGEST

THE JOURNAL FOR R/C SOARING ENTHUSIASTS

ABOUT RCSD

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

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On-Line Articles - Great articles originally written for the printed version of *RCSD*.

..... "Trimming Your Sailplane for Optimum Performance" by Brian Agnew
 "Flies Faster" by Dr. Michael Selig
 "The Square-Cube Law and Scaling for RC Sailplanes" by Dr. Michael Selig
 "Modifying & Building the MB Raven (Parts 1-4)" by Bill & Bunny Kuhlman

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

Complete RCSD Index, 1984-1999

The Soaring Site

Are you out there?

When one gets an e-mail message that begins by asking us if we're 'out there', the first picture that went through my head was a vision of martians, 'out there', just like on the X-Files... Then, reality strikes, and I realize that someone may simply be looking for *RCSD*. Opening the e-mail message, that was, indeed, the case.

"Dear *RCSD* - I see that your web site has not been updated (October?). You have the best magazine on the market. I just wanted to know if you were still

in business; I would like to get a subscription.

"Also I have been looking all over for a high tech flying wing that is a kit or complete. (I don't cut foam.) Something like the C07. I have tried Bill and Bunny and they don't have any leads. It seems like Europe is passing us by... I have tried contacting them as well and have had no luck.

Thanx for your time (signed),
Doug Coulter
dbcinlb@earthlink.net
Long Beach, California

Well, Doug, we assured you that we were 'out there', and perhaps there is a reader out there that might be able to help, as well. If any of you can help, please let us know at
<RCSDigest@aol.com>.

Snow Flying in Dallas?

In a message from Marge & Dale King, Wylie, Texas, they report some really cold weather this winter. We were not aware that they got 4 inches of snow this last month. Whew! Glad to have missed out on the cold, then Gordy dropped us a message saying that he was in the Dallas area. It seems that the wind was blowing 40 miles per hour, steady! Whew, missed out on that, too!

One thing we're sorry to miss out on are the Texas folks. Hope all of you are staying warm, and that the wind will die down to a reasonable level so you can be out and flying, soon! And, for all the other *RCSD* subscribers experiencing weather that they simply have to endure, hope you're staying warm, as well!

Sloper's Resource

What's a Sloper's Resource? Exactly what it says. And, Greg Smith is with us this month, as a new columnist, to tell you what it's all about. We welcome Greg to the *RCSD* dedicated group of writers, and hope that more of you will find the time to share your experiences, as well.

And, speaking of writers, three sailplane enthusiasts took the time to write and, what with the delays on getting *RCSD* mailed, their articles have been hiding in the wings, until now. My thanks to Ryan Woebkenberg for his well written Chinook kit review, Les Grammer for his delightful story about a tree that fired back, and Fred Sanford for checking out Hobo Sloping at the giant Holstein site and updating us on the original "Have Sailplane Will Travel!" saga. Since I am preparing the November and December issues, at the same time, your articles should appear in one or the other. Once again, sorry for the delay!

Happy Flying!
Judy Slates



**The Great Midwest
Oc-Tow-Berfest 2001**

Bob Harold's 4 meter span DFS Reiher from a Bob Sealy kit. Mark Nankivil had a chance at the controls, and had that baby skied out! Nice flier!

Photography by Mark Nankivil, St. Louis, Missouri.



Jer's Workbench

Jerry Slates
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Flying in California

Well, folks, having officially retired, I still haven't had much time to get into the flying mode since returning to California after living in Texas for the last 10 years. There's been a lot to do, as always with moving, but this month I wanted to share some of the e-mails we've received since our arrival. Most of us are familiar with many of the larger events such as the yearly Visalia CVRC, however there are several events that do not get the same coverage.

Late last year, we received an e-mail message from Doug Skjerseth in the Clear Lake area, Kelseyville, California. He belongs to or participates in 4 clubs in the area. The one that got my immediate attention was the 1000 foot runway up Lake County way!

Not finding the time to get back to Doug, it was only later that we took to the web, following the trail of web addresses that Doug gave us, starting with:

<http://www.proseth.com>

From Doug's site, I was able to link to the Clearlake Modelers, and found the contact information for an old flying friend, Tom Overton, also in the Clear Lake area. Well, to make a long story short, I hope to make it up to the field and catch up on what the folks are flying and building. And, of course, I sure hope to start doing a little flying, myself!

Welcome to the Left Coast!

Another e-mail that I wanted to share is from Dudley Dufort, Sacramento Valley Soaring Society. I hope to get up their way and attend a few events, as well!

Dear Jerry & Judy,

"I'm writing to welcome you to sunny California and some of the best flying

in the free world. We had some GREAT air yesterday. When you get some time, drive out to Davis (about an hour) and join us at our flying site. SVSS has (in my humble opinion) the best, obstruction free, flying site in the U.S. You'll find guys flying there every weekend that the weather allows. The club web site has a map to the field and a calendar of events. SVSS is about 125 members strong and we have quite a few members in the North Bay communities. As a past club president I'd like to encourage you to join us for some fun. You've always been very generous in your support of our annual two-day event, Spring Fling, and we appreciate that. Don't hesitate to call or contact me if I can be of any assistance to you. My office number is (916) 448-1266, home is (916) 991-1266. Our club web site is www.svss.org. I look forward to meeting you personally. Come out and join us. All work and no play makes Jerry . . ." (You got that right, Dudley! Ed.)

(signed) Dudley

Davenport ISR 2002

And, then there's the folks down Davenport way! It's been quite a few years since I attended the International Slope Race, but it is an event that I'll always remember. A lot of folks attend this get together, and the flying is, well, unbelievable! The only caution I have for folks attending the event is: don't sit on any unidentified grassy area. Unless you're luckier than me, you may wind up with poison oak. (Of course, it's been a lot of years since I attended, so maybe the unidentified stuff has since been cleared?)

Anyway, the following e-mail arrived from one of the folks actively involved in the upcoming ISR, Craig Toutolmin.

Hi Judy and Jerry,

"Welcome to the extended Bay Area.

This is definitely a Mecca for slope soaring enthusiasts.

"I am actively seeking sponsorship and event coverage for the Davenport ISR 2002 (May 4-5). This is the biggest unlimited MOM slope race in the country with pilots coming from as far away as the UK. We need cash donations, merchandise donations or a super deal on a big ticket item that is slope racing oriented. Sponsors will be listed on the information page at [Sloperacing.com](http://sloperacing.com).

<http://sloperacing.com/isr2002.htm>

"With only a few days of begging the current list of sponsors includes:

Shred-Air
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Cavazos Sailplane Designs
Al the Bag Lady
Bowman's Hobbies
Dave Reese Productions
Hewett Construction
Lindgren Excavation
Serves You Right Catering
Radio Carbon Art
Slopecflyer.com
Sloperacing.com
Hanger One Hobbies

Thanks, Craig Toutolmin
craig@thehelix.com

Well, folks, first of all, the event has been added to the schedule, and Craig plans to provide us with additional information on the event. We're currently looking for someone to cover the event, so we can find out what folks are building and flying that can withstand the speed required to compete and complete the race! Should you be able to help Craig out with his requests, his e-mail address is included above.

Windows Plotting Programs

Airfoil Plot 8 \$35

Model Design 8 \$50

Airfoil Plot and Model Design are now available for Windows 95, Windows 98, and Windows NT. Features include the ability to use airfoils downloaded from Michael Selig's airfoil data base, export airfoils in DSF format for use with CAD programs, and plot airfoil templates for cutting foam cores upright or inverted. Nothing else to buy Over 400 airfoils plus NACA and Quabeck airfoil generators are included. Airfoil Plot 7 and Model Design 7 are still available for MSDOS and Windows 3.1 users. Shipping \$5. Send #10 envelope with 55 cents postage for demo disk.

emiali_canders@edge.net
Chuck Anderson, P. O. Box 305, Tullahoma, TN, 37388 Phone 931-455-6430



Hobo Sloping!

by Fred Sanford
Bemidji, Minnesota
sanford@paulbunyan.net

Recently, I've renewed my interest in soaring. This after many years of other types of R/C flying.

While at the Toledo Show last year, I picked up some sample issues of *R/C Soaring Digest* at the LSF booth. While I subscribed after looking at the samples, I really didn't think much of them until I attended a "Soaring Safari" in South Dakota this October with members of the Minnesota R/C Soaring Society. After the "Safari," I

looked at the back issues and again read Al Nephew's travel saga in the April 2000 issue titled: "Hobo Sloping the Giant Holstein Butte... More Adventures in the Badlands."

Well, what do you know? Seems the Giant Holstein was less than 300 miles West! My son, Matthew, and I decided to visit this mecca of sloping.

Matthew flew a Zagi Two Meter Beater. I flew a Zagi LE, and when the lift lessened, I flew my Paragon.

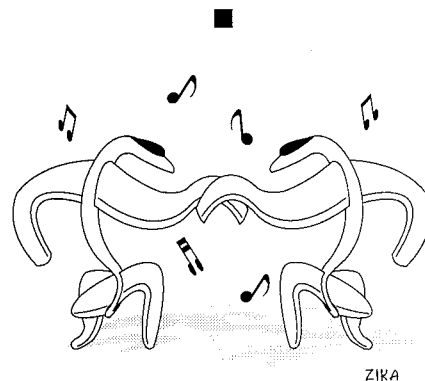
You can drive almost to the top of the site. The view looks out over the prairie and thermals passed through frequently. Lots of fun. All the while the "New Salem Sue" watches from behind your back! (We did look for evidence of the Hobo Sloper's presence but were unable to find any.)

All kidding aside, the slope though small, is a good one. You can use W, NW, N, NE and E winds. (E and W are best.) The ridge behind the "Big Moo" faces due West and East with a tiny

path on top. As Al states in his article, the East and West slopes look perfect for Dynamic Soaring.

The World's Largest Cow is located in New Salem, North Dakota about 30 miles west of the capital city of Bismark on Interstate 94. The exit number is 127. Overnight accommodations are available at the Sunset Motel in New Salem, North Dakota. The motel features window views of the Holstein for a single price of \$29.95 per night (1-800-441-5019).

Is this one place Gordy hasn't visited?



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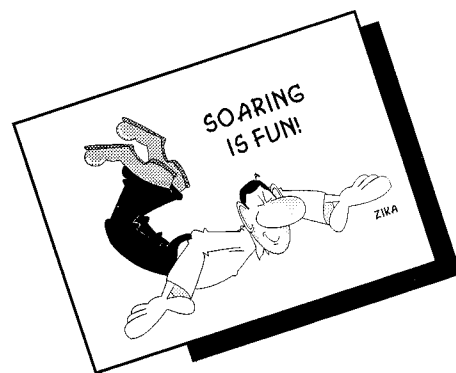
THE JOURNAL FOR R/C SOARING ENTHUSIASTS

A MONTHLY LOOK INTO THE WORLD OF SAILPLANE ENTHUSIASTS EVERYWHERE

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RCSD encourages new ideas, thereby creating a forum where modelers can exchange concepts and share findings, from theory to practical application. Article topics include design and construction of RC sailplanes, kit reviews, airfoil data, sources of hard to find items, and discussions of various flying techniques, to name just a few. Photos and illustrations are always in abundance.

There are *RCSD* subscribers worldwide.



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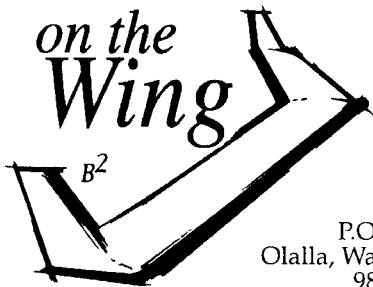
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Larry Haig's Minibat

The chance to build a reasonably sized 1/2 scale sailplane does not present itself very often. In this case, the model wing span would be just 12.5 feet. That's right, the wing panels turn out to be less than six feet long!

The Minibat was Larry Haig's response to what he saw as fundamental problems within general aviation in the late '70's. His goals during the design process included safety and performance at the lowest price, achieved through use of modern materials and recent revisions to FAA regulations; quick building time, approximately 40 to 80 hours; small size and an ability to serve as an inexpensive teaching platform; a modular design which could be expanded to a larger span and better performance without major modifications. Unfortunately, the Minibat did not fulfill safety requirements, and kit production was terminated. Approximately 55 kits were sold.

Planform and controls

The Minibat is also somewhat unique from a planform standpoint in that the wings are swept forward more severely than is usually seen in tailless aircraft. Jim Marske's Pioneer II and Monarch, for example, have much less forward sweep of the quarter chord line.

Controls are conventional, despite the

tailless planform and forward sweep. Central elevators, outboard ailerons, and rudder encompass all of the control surfaces of the original design. For landing, the ailerons can be raised into a spoileron position, while the elevator deflects downward to act as a flap. As of an information bulletin dated April 1981, the outboard ten inches of the elevator could be turned into split panel dive brakes. This modification is noted in the included 3-view in the top view, right wing.

Construction

Minibat construction was unique for the time period. Most of the 18 major parts consist of a PVC core with fiberglass on both sides and formed in a female mold. A few dozen hardware parts are sufficient to complete the aircraft. Despite the extent of molding and preformed parts, the FAA determined that the aircraft is 64.5% fabricated by the builder.

The wing consists of molded upper and lower shells of E-glass and foam, a spar using unidirectional S-glass for the caps, and molded shear webs of glass and foam. The shells are held together at the leading edge by J-joint, and at the trailing edge by the molded rear spar. The elevators and ailerons are made from molded glass upper and lower surfaces over glass and foam ribs. The wing halves attach internally at the centerline with pins. Additional wing panels of about four foot length became available to increase the wing span and decrease the wing loading. These extensions substantially improved gliding performance.

The fuselage is built in the same way as the wings, except there is no spar cap. The outer skin carries the bending

loads and the inner skin carries the torsional loads. Reinforcement is provided in the area of the landing gear, tail skid, etc. Besides a J-joint on the outside, the fuselage is tied together on the inside by the seat, armrests and keel.

The fin and rudder are constructed like the ailerons and elevators — glass skins are placed over foam ribs.

Airfoil

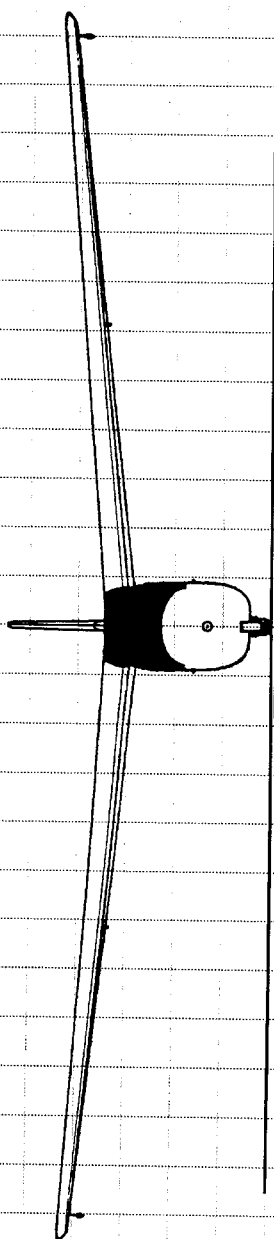
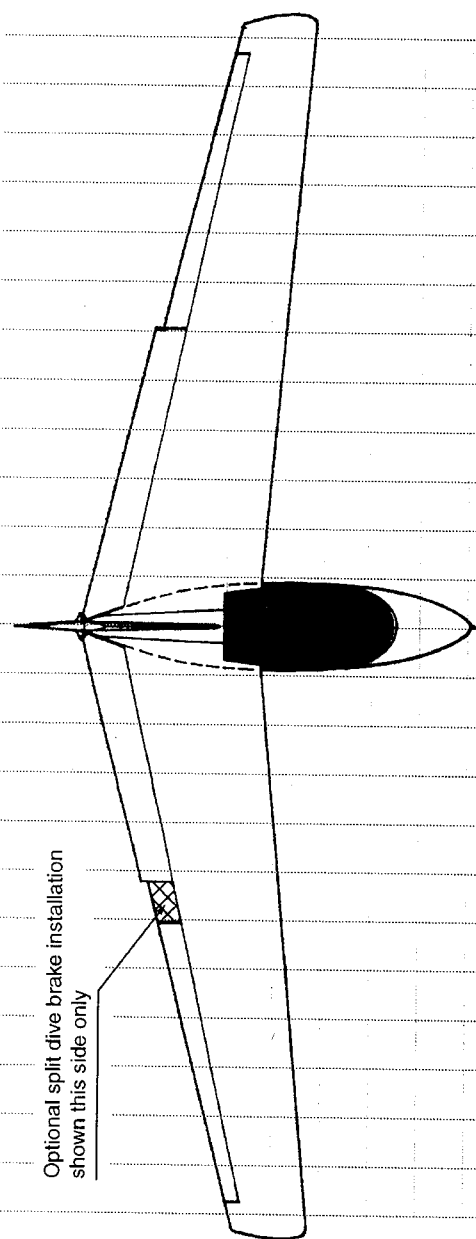
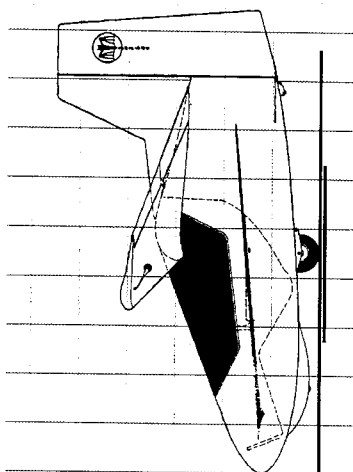
Perhaps the most problematic component of the Minibat is the airfoil. A Liebeck section (maximum camber at 20% chord, camber = 5.5%, thickness = 14.5%) was used in an effort to achieve a high coefficient of lift. The Liebeck airfoil was one of the first computer-designed sections, and the code at that time was not reliable. It was predicted that the section would achieve a maximum coefficient of lift of at least 1.4 while not having the excessive drag of other high lift sections. Evaluating the Liebeck section with modern computer codes, the Liebeck section does not live up to its expectations.

- The upper surface does not behave well at Reynolds numbers below three million. A good sailplane section should be good down to $Re = 500K$ or lower, depending on the local wing chord. The Minibat mean chord is 30 inches, and the Reynolds number in slow flight is around one million. The wing tips just cannot produce enough lift, and the reaction of the pilot is to feed in more up elevator. Up elevator produces a large down force, counteracting the lift generated by the wing. Jim Marske predicted that the maximum coefficient of lift of about 0.8 under these conditions, just 60% of the predicted value.

Haig Minibat

Span	25 ft.
Length	9.33 ft.
Height	5 ft.
Wing area	65 ft. ²
Airfoil	Liebeck
Weight, empty	105 lbs.
Weight, max.	325 lbs.
Load limit	6.0 G's

First flight 11 March 1979



• The bulbous protrusion on the lower surface near the leading edge causes a large amount of drag at high speed. As the angle of attack decreases, this area acts as a lower surface spoiler. Poor upper surface boundary layer control at low speeds and this lower leading edge protrusion which causes exceptional drag at high speed severely limit the speed range of this section.

• Because of the upper surface behavior at low Reynolds numbers, the ailerons on the Minibat do not start operating until the aircraft has nearly reached flying speed.

• The Liebeck section is not so stable as had been originally thought. In fact, some amount of up elevator trim is required for stable flight. This is not a problem in the Minibat, as the elevator is large, but it is something to keep in mind.

Since the Liebeck section performs so poorly on full size aircraft, its performance on a model, even at half size, can be easily predicted to be abysmal. We've looked through our collection of airfoils and found what we believe to be a suitable replacement.

Dave Jones was a prolific designer of airfoils for use on plank planforms. Rather than use sophisticated airfoil design programs, Dave utilized relatively simple mathematical formulae to define camber lines and surface contours. His technique was much like the old NACA 4-digit and 5-digit methodologies and the resulting airfoils are turbulent flow sections. This is exactly what is needed for modeling purposes.

One of Dave's last sections was his CJ-21509 (maximum camber at 20% chord, camber = 1.5%, thickness = 9%). Note that the maximum camber point of the CJ-21509 exactly matches the maximum camber point of the Liebeck airfoil. By increasing the camber of the CJ-21509 to 5%, that parameter can be made roughly the same as the Liebeck. We remain somewhat leery of increasing the thickness to 14%. For this reason we've plotted other modifications of the CJ-21509 with variations of camber (4% and 5%) and thickness (12% and 14%).

We very much recommend that the builder construct a primitive all foam wing and ballast it to match the

anticipated wing loading of the completed scale model. A free flight prototype would be fine. This is the only way to determine if the chosen airfoil will actually work well at the scale model Reynolds number.

Idiosyncrasies

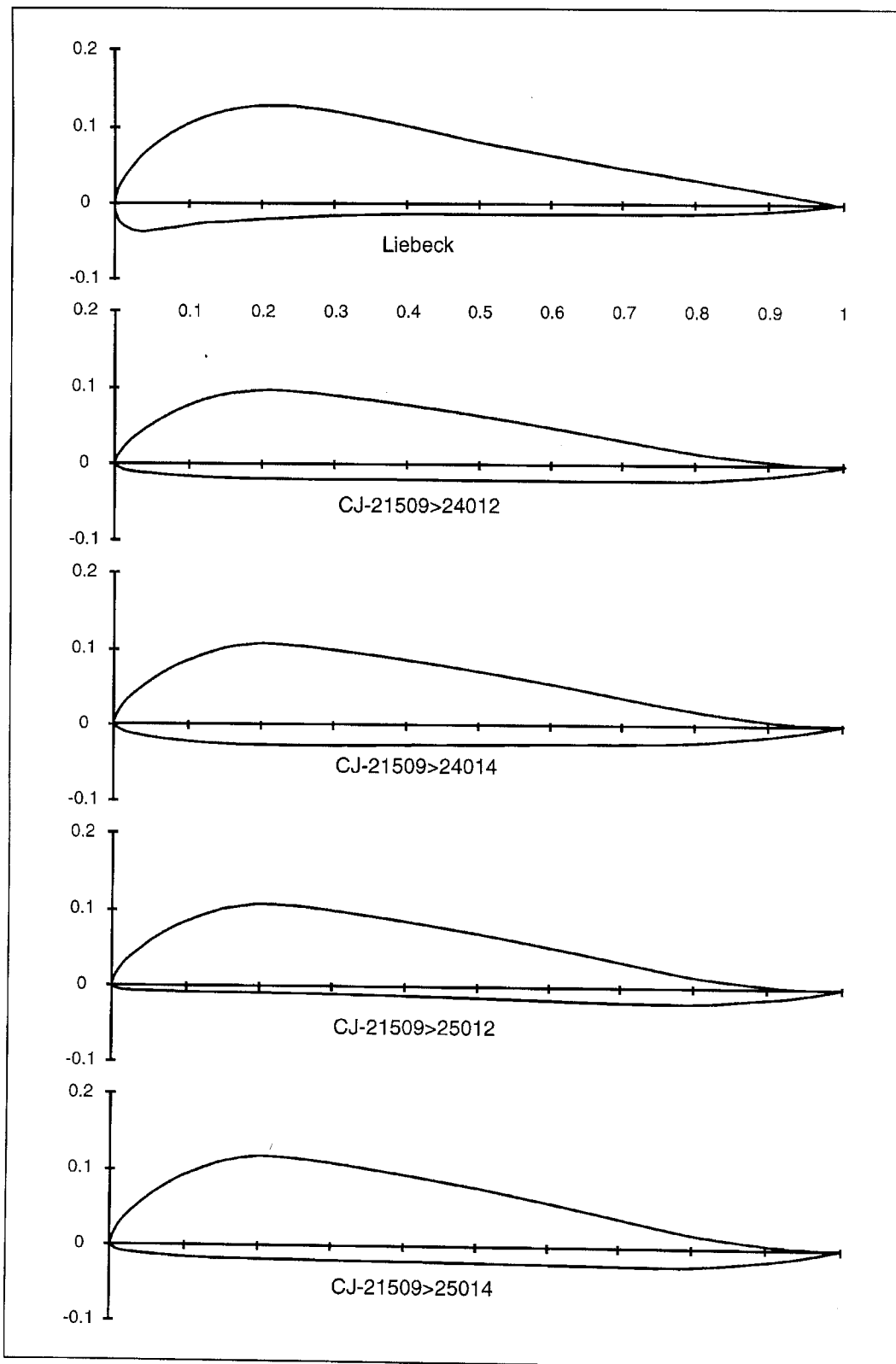
During ROG takeoff, whether by winch or aerotow, there are pronounced pitching moments which require compensation. When level on the ground, the CG is below the wing and directly over the main wheel. While standing still, nose down and

ready for takeoff, the CG is in front of the wheel. This is because the CG is well above the axle. The elevator and wing reflex are producing no down force at the rear. As the takeoff roll begins and the air speed increases, the forces generated by the elevator and airfoil reflex increase with the square of the speed. The aircraft starts to rotate once these aerodynamic forces are great enough, and the CG moves back in relation to the wheel. As the CG moves over and past the wheel axle, the aircraft is pitched up by both aerodynamic and mass forces. The greater the upward rotation angle, the more the aircraft will want to rear back even further.

It is therefore possible to lift off the ground at a speed less than the minimal flying speed. The wing is fully stalled under this condition, the aircraft is not controllable, and a crash is nearly always inevitable. Two fatal Minibat accidents can most probably be attributed to this behavior. Jim Marske reports, "As I understand it, both accidents occurred during the takeoff run and the gliders cartwheeled down the runway. One wing struck the ground causing a groundloop."

It is imperative that the nose be kept down until flying speed is reached. Once at flying speed and in the air, the location of the CG is below the wing, so the aircraft is self-stabilizing in this regard.

The canopy seal must be carefully watched. Air leaks in this area severely degrade performance.



Full size flight experiences

Two flight experiences, while rather harrowing, point out both positive and negative aspects of the Minibat design. The first episode, as told by Jim Marske, appeared on the nurflugel e-mail list while we were researching this column:

"To clear up some mystery concerning the Minibat at Elmira, New York back in the '80's. We had a meeting of the U.S. Sailplane Homebuilders group. Al Backstrom, Larry Haig and myself gave presentations on flying wings. Just as I completed my presentation on the Monarch and Pioneer 2, I was told that Larry was about to auto tow his Minibat down the Harris Hill runway. If you are not familiar with this airstrip, it is about 1,800 feet long with a considerable dropoff at each end. The Minibat, even though it was small and light, it had a small wing also which resulted in a fairly high wing loading. So takeoff speed was quite high and required a lengthy run just to get the glider into the air.

"Just before my presentation Larry told me that one of his elevator bellcrank brackets had come off. He decided to anchor the bracket with a pair of vise grips (a cam lock pliers). Well during the bouncy takeoff the vise grip pliers let go and the young pilot was left without any elevator control. The Minibat proceeded to climb very steeply to about 200 feet (65m) where the pilot released. The nose high glider stalled and dropped vertically for the ground. The pilot, being a hang glider pilot as well, shifted his weight as far back as he could to effect a recovery - which fortunately worked. The Minibat rounded out just short of the ground and skimmed the runway. The pilot threw his weight forward to keep the glider on the ground and stopped just before he slid off the edge of the steep hill. Only the grace of God and his hang gliding experience saved him.

"An amusing ending to the story... One fellow was expounding on how dangerous flying wings were as unstable and uncontrollable. I interrupted and asked him just what would he have done if he were in a tailed glider and the elevator control

did not respond. I added that if he had been flying anything other than a flying wing under those circumstances he surely would have been killed. The short coupling of a flying wing and the rather narrow c.g. range made for a responsive to weight shift pitch control."

Mat Redsell's experience was nearly fatal as well. For some reason the CG was misplaced during preflight and was too far forward, and this led to a rather severe dive upon release from the tow line. Elevator deflection was not sufficient to correct the situation, so Mat tried shifting back in the seat, much like Larry Haig had done at Elmira, but to no avail. In desperation, he folded his knees closer to his body. This moved the CG far enough aft that the aircraft was controllable in pitch, but the rudder was free to deflect on its own and it simply followed the oncoming airflow.

In contrast to a swept back wing, a forward swept wing is directionally unstable. As soon as he removed his feet from the pedals, the Minibat started yawing. The resulting side slip drastically reduced the glide ratio, and stretching the glide to achieve a landing site was next to impossible. When he put his feet back on the pedals to reduce the side slip, the Minibat went into a dive. With a landing site in view, Mat set up an approach. At that point, the Minibat went into a side slip and the canopy blew open. Mat somehow managed to get the canopy closed and make a "successful" landing.

Conclusion

Despite the relatively poor, unpredictable performance and safety concerns of the full size Minibat, it should make a very good scale model. In a model, the CG will not move, control surfaces will maintain direct connections to driving servos, and human life is not at stake. No matter the airfoil chosen or the scale of the model, keeping the weight down will be the primary factor influencing performance. Lower weight equates to lower flying speed and more rapid response to control inputs. Additionally, a model at half scale is reasonably sized and would be easy to detail.

Readers wanting coordinate tables for

the airfoils mentioned in this month's column need only send a request to us at either our post office box or e-mail address. Suggestions for other viable airfoils are especially wanted.

We would appreciate hearing from anyone contemplating construction of a scale rendition of this aircraft. As usual, we can be reached at P.O. Box 975, Olalla WA 98359-0975, or by e-mail at <bsquared@appleisp.net>.

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"The Sloper's Resource"

Slopeflyer.com

By Greg Smith
greg@slopeflyer.com
http://www.slopeflyer.com



And now, an open editorial to the sloping community in general and some guys in the Midwest in particular. You guys know who you are.

I hear it all the time, "Oh! Yeah! That Gordy guy did this..." Truth is, Gordy picked up his soaring addiction right here in the good old Midwest. Milwaukee, Wisconsin to be exact and sloping to boot. You can thank Mirko Bodul any time you see him for getting Gordy into soaring in the first place! Of course, you have a much better chance of seeing Gordy out and about (than Mirko), promoting the sport and riling people up to participate.

Part of what got Gordy interested in soaring is the same thing that got Mirko, Russ, Tracy, and the rest of the group that gets together here from time to time interested. Excellent sloping! We have several great spots

along the shores of Lake Michigan and a short trip West gets you to The Big M in Platteville, Wisconsin or Southeast to Mt. Baldy at the southern tip of Lake Michigan. I guess it takes a bit of a tenacious spirit to brave the elements and slope all year, but guys from the Midwest are made from hearty stock.

Which brings me to part of the reason I am doing this story; Gordy said to. A few times! A gentle reminder that the soaring community depends on the charity and dedication of a few selfless souls who contribute articles to publications like RCSD. You may not always agree with the point of view of the author, but the beauty thing is that you will have an opportunity to get published, too. Just put together an article and submit it!

Introducing, drum roll please, "**The Sloper's Resource**", until a better

name is found. (If it were to be only about Dynamic Soaring we could call it The DarkSide, but maybe that is for a different column.) The idea here is to get the sloping community involved more with RCSD. So with a bit of luck, we are going to get an article together for each issue.

Here is a bit about what I am doing to help promote our fair sport.

I've been working on the **Slopeflyer.com** web site for over a year now with the goal of helping new pilots and traveling pilots find slopes wherever they are and provide reviews of planes and products that are suitable for slope use.

When the web site started as "Midwest Sloping", the idea was to post articles about various sites in the Midwest where good slope conditions exist and a list of pilots who fly there regularly. Turns out, the idea was good enough to expand the reach to the entire US. In fact, now with submissions from around the world, an international reach is not far away. We have over 90 sloping sites listed from 35 states. Plus, New Zealand. If your state is not there, or your local hill is not listed, get on the ball and submit a site. Most of the sloping places on the Slopeflyers.com were submitted by local pilots just like you.

I learned in to slope soar in California in the early 80's but sold all my slopers in 1986 when I moved back to Milwaukee. I was not into thermals and HLG did not exist. So, reluctantly, I quit. It turns out that all during the next 15 years, when I was not flying, guys in the area were and I never knew it. Part of the fun of flying for me is having buddies who are into it, as well. If a resource like slopeflyer.com had existed back then, I probably would not have missed all those years; of course, the World Wide Web did not exist then, so readily available info. was not, well, readily available.

The same type of enthusiast authored submissions that make slopeflyer.com what it is, and will be responsible for its continued growth, make RCSD what it is. Contributions from guys on the hills and in the fields drive our sport forward.

I plan to do a column from time to

time, including covering events I attend such as the Midwest Slope Challenge, Rob Hurd's South Dakota Slope'n and DS 'University'; and, if things go as planned, a 3 to 4 week trip to Montana, Idaho, Washington, Oregon and California. I will be hitting many famous spots along the way and hopefully discover a few new ones. So, I'm good for at least 4 articles a year, and with your contributions to help we should have lots of great slope information to share. Chances are that if you find a subject interesting, so will many other folks, and they would love for you to tell them about it.

In a way this is a self-serving plea because I don't have the time to do the site and write a column every month. We need a couple more slope-centric guys in other areas of the country to put together an article a couple times a year. This would give RCSD a running monthly column dedicated to slope flying. With DS becoming so popular, coverage of new sites is always appreciated. All facets of sloping F3F, Scale, Combat, plane reviews, whatever, are fair game for reporting! Sloping is so diverse that it deserves good coverage from the guys who are out there pushing the envelope. (If you don't know what 'DS' is, stop over to Slopeflyers.com, or e-mail me!)

I am looking for slope stories from your experiences, from years past or days past. We want to know about your homebrew slope planes, construction techniques, thoughts on your

new foamie. Especially if you are planning on producing a new slope plane or product for sale! We all want to know about it.

With all that said, it looks like RCSD has a Sloper's Resource Column. Ready or not, here we come! In the next column, I plan a 'bio' of sorts on Russ Whitford, Mirko Bodul and myself, so that you can get to know us 'Midwest Guys' better and so that you can see we all started differently, but share the same enthusiasm for the hobby!



Announcement

Midwest Slope Challenge 2002

from Loren Blinde
mwsc@alltel.net

The 2002 edition of MWSC will be held May 17 - 19 at Wilson Lake, Kansas. Registration opens Friday, February 15. All the pertinent details and procedure can be found on the contest web site: www.alltel.net/~mwsc.

Nothing earth shaking will change from our customary format. We have four new suppliers of One-Design Racing kits this year, details and links on the web site. The registration fee has increased by \$10, which can be recouped with a \$10 discount for pre-registration and paying in advance. And we have a new pylon light system to signal turns, which looks promising.

So there you have it. We hope you're planning to join us for another fun event.

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Mention RCSD!

GORDY'S TRAVELS



Xterminator Pro DLG fly by.



My travels took me to Pennsylvania where I met up with Denny Maize for some sloping on the Susquehanna River, just above York. At that time Denny was hooked on Hand Launch, had some prototypes which had been flying for some time, along with Bill Grenoble and a few of the other great guys they hang with out there. At the time, the 'javelin launch' was all the rage. He's come a long way, since then and seems to have found his niche with the discus launch generation of HLG's. I asked Denny to fill us in on some history and here is Denny with his version. And, he's sticking with it!

Pole Cat Aeroplane Works or, Where did you come up with that name??

by Denny Maize

It's easy if you live in the middle of nowhere on Polecat Road! In January 2001, Pole Cat Aeroplane Works was a fledgling "Cottage Business"

being run part time in hopes of some day becoming full time or a retirement business. Things change fast and the "day job" went away suddenly making the decision process simple. We are now a full time airplane manufacturer.

Having been involved in the "Terminator" project with friend Bill Grenoble and basically a hand launch fanatic, the course of action was obvious: go with what you know. I was already

making the Xterminator a "Logic" style, long boom, Javelin launch kit which was doing very well, and along came DLG. Phew, what a ride! Everybody involved in the manufacture of handlaunch was pulling out their hair for a few months with this revolution. Design something only to have it fail, redesign to fix the failure and find a new stress point that you didn't even know existed. As launches got higher and harder, more design areas needed to be addressed. As most pictures of me will tell you, I pretty much succeeded in pulling my hair out.

The first real DLG plane from Polecat was the SideWinder, which was basically a redesign of Paul Siegel's Nats winning Disco design. The Sidewinder proved to be a good design and served very well early on in DLG. In May of 2001, the Xterminator Pro was born, just in time to be in the capable hands of Bruce Davidson and Craig Greening for the IHLGF. What a great job these guys did! Bruce finished the Comp rounds in 3rd place and Craig, after hanging around 6th or 7th place for two days, just got bumped from the flyoffs by a mid air in the final comp round. Two terrific pilots. The Pro features all the positive aspects of the original Xterminator design with all carbon/kevlar construction. The Pro fuse is all carbon/kevlar vacuum bagged with fingerholds molded in for tasks such as the ladder round and the super stiff Allegro 2-meter boom and bagged balsa tail surfaces. I think it is the stiffest DLG fuse out there. Wing is all carbon/kevlar construction for toughness and durability. The Pro also is available in a bottom hinged aileron

version for those who just "have" to have ailerons. They are bottom hinged so that they can be dropped as flaps for quick turn-around times.

While this was happening it became apparent that some changes could improve performance of the Sidewinder, also. The original SW had a pretty hefty wing planform and the thinner airfoils were obviously out launching us. The SW also has an Avia boom which is not as stiff as the Allegro boom. A new wing planform was devised which is very close to the Pro and the airfoil was changed. Much bigger launches and improved penetration without loss of performance! The boom was shortened considerably to lessen the effect of the flex and the tail size changed accordingly. I am trying to keep the SW in a more "affordable" bracket and still be competitive, so the boom was not changed. Did all this work? You bet. The Sidewinder II, as it is now called, has been doing well all over the country.

By July 2001 and Nats time we were pretty well set in our designs and the planes were doing well. Bruce Davidson is your 2001 National hand launch champion flying the Xterminator Pro and Jeff Winder snuck a Sidewinder II into the top ten. I'm not sure if I'm happy about that or not since he pushed me back to 11th. Hmmm...

Hand launch R&D continues with some excellent help from Mark Drela on new design and airfoils and you never know what might crop up in 2002. We all owe Mark a big debt of gratitude for the rapid advancement of handlaunch airfoils and design ideas. There is also an electric seven cell speed 400 sailplane in the works based



Dave Hauch's Hammerhead



Denny Maize at 20001 NATS.

on Marks popular Allegro series. The electric will likely be offered with a "break down" for travel option featuring a 3 piece wing and removable tail. This one will feature composite wings and a center flap for landing control and span roughly 73".

We do a lot of sloping around here when the wind cooperates and the next plane to be released by Polecat was the Hammerhead, a completely new "one design" legal sloper with a "swept forward" planform. Mike Garton provided the design work on the forward swept planform and a whole lot of work on stability and handling while I did the rest. At the time of writing there are several dozen out in the field with excellent results. The



Peggy Maize with new Hammerhead ODR.



Sidewinder II

Hammer is just different than anything you are used to seeing. Performance is excellent. One customer who is a bonefide "slope head" says it's the best handling slope plane he's ever owned. Fuse is round with a slip on nose cone and the tail is easily made removable at the builder's discretion. A lot of the fabrication work is already done for you in that the wing is sheeted and leading and subtrailing edges are already attached and about 90% shaped taking the pain out of building a wood wing. A v-tail option and a "go fast" 60" replacement wing for those who are not going to race are in development at the present time. More slope stuff is in the works including a PSS project and a bigger "go fast" plane.

With continued cooperation from my wife Peggy and, maybe, a little help from the boys, I plan to continue


growing the Aeroplane works. We will always have competitive handlaunches but would also like to keep branching out into slopers and sport planes.

We have always tried to give the best product value for the money and only offer products that we think are of good quality. Look for an updated web site with more articles and products. Pole Cat Aero enjoyed a lot of success during the past season on the contest circuit. This was not the highlight of the year, however! The best part was getting to travel to all corners of the country to meet new people and fly with some customers and new friends.

Had someone told me 2 years ago that I would get to go to Poway, Parker, Torrey Pines, a week of Nats, DARTS HL, handlaunch with friends in NJ and more, I simply would have laughed. It's been a great year! Thanks guys for making it that way.

Denny Maize
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KIT REVIEW

Chinook

by Ryan Woebkenberg
Carmel, Indiana

About a year ago, I ordered and built a Chinook from Thermal-Gromit Works. I was so impressed with this little hand launched glider (HLG) that I immediately ordered and completed 2 more kits. Since then I have left the traditional 'javelin' thrown hand launch world altogether. The Chinook is designed for hand launch thermal flying or light to moderate lift sloping, incorporating the high altitude wingtip style launches. As a flying wing, the Chinook, with its long tail, has excellent, tight turning capability for coring lift. It can be trimmed to be very stable, or quite aerobatic. The Chinook is not intended to compete with today's high-end fiberglass, discus launched HLGs; however, it does offer advantages that will allow it to hold its own.

Kit contents

When you first open the Chinook's box, you will notice a very complete kit. Covering tape, magic markers for decorating the glider, transparent heat shrink covering for the balsa parts, and

complete linkages hardware are all included. The only items not included that are required to build the Chinook are traditional adhesives, 3M-type spray adhesive, standard shaping and cutting tools, and ultra light radio gear. The instructions are very well written and quite comprehensive. Diagrams are included for all the complex portions and each step includes plenty of text to explain the task. Any experienced builder should be able to complete a Chinook kit in just a few evenings.

Chinook Construction

I won't go over each step of the construction, as the kit's instructions are more than adequate. However, I do have some suggestions for builders.

The lighter the Chinook the better it will perform in weak lift. The kit's specs boast 5 to

5.5 ounce all up weight. I found that with some care, I could build a 4.5 ounce Chinook. My 4.5 ounce Chinook launches high, yet floats much better than the first 5.5 ounce one I built. If you plan to fly your Chinook at the slope, for the most part these weight saving suggestions can be ignored. Take care in assuring that the balsa for the elevons and fin are as light as possible. The lighter these parts the less nose weight will have to be added later. Don't use the included iron on covering for the balsa parts. Instead, save yourself some weight by using a few light coats of polyurethane or aircraft dope to seal the wood. It should be noted that using the kit's included iron on covering does add to the durability of the fin, so if you plan to land the Chinook in rough areas this should be taken into consideration. The elevons should come out at around 3 grams, and the completed tail should be around 5 grams. I found I only needed to add very minimal extra nose weight by putting the gear as far forward as possible. As can be seen in photo 1, I actually routed the bays for the

receiver (A) and battery (B) in the EPP leading edge. I used 6.2 gram servos, the 9 gram JR 610 micro receiver, and 17 gram 150 mA NIMH battery packs. Be sure to route the antenna in the opposite wing that you throw from, as its weight will help offset the weight of the styrene pieces that go where your fingers go to help minimize crushing the wingtip. (Also, any needed nose weight should be added to the heavy wing. In all my Chinooks I needed weight on the opposite wing I threw from.)

It is important for the radio gear to be as slop free as possible (When is it not??). The instructions are very clear in this area. I have tried double sided tape, epoxy, and liquid nails type adhesive for servo securing. Epoxy works well, but does not have any give. The best suggestion for servo mounting is to make the servo cutouts only as large as necessary and apply a liberal coat of silicon adhesive. If, after some hard flying, the foam around the servos have become damaged, one can always use some sheet balsa and epoxy to surround the servos. Wrapping the servos in masking tape will assure that if you choose to remove them the epoxy or silicon adhesive can be easily removed.

Chinook tips and suggestions

Be sure to save the Styrofoam wing 'shucks', as they make for great wing 'bags'. Simply fold the Chinook in half, and slip it between the bottom shucks. Then use a few pieces of tape to



Photo 1 (All photography by Tracy Woebkenberg.)

complete the Chinook carrier. You can slip the fin between the wings. See the photo 1 for a visual example. With this arrangement, there is no excuse for not having a glider to fly, no matter where you are. The Chinook, transmitter, chargers, and a few days cloths can easily be stowed in a hard case airline carryon bag. I often bring a Chinook along on business trips to try out new flying locations and have enjoyed the slopes at San Jose and off the coast of Puerto Rico! The Chinook must be the most transportable slope/thermal glider on the market, allowing many pilots the ability to combine soaring with backpacking, cycling, or other such activities.

The wing is simply held together with masking tape, and the tail is taped on in this same method. This means it is literally seconds between when you park your car and have a glider in the air! Your field equipment only needs to include the Chinook, your transmitter, battery charger, and masking tape! At first, this masking tape method might seem a bit frail or inelegant. I can assure you that after many hours behind the sticks, the wing joint has only failed for me when it was important (hard landing). Do be sure to get good adhesion for the tail, although even if it does come off on launch the Chinook still flies acceptably sans tail (a bit less stable from a yaw standpoint, and launches without the tail are erratic).

Flying the Chinook

The launch takes a bit of practice to get used to. If you're not used to the underarm type swing, you may find this launch requires some muscles that you don't normally use. After a few sessions of Chinook launching, the soreness will go away. It also takes several sessions to realize full launch potential. The 150 mA NiMH packs should allow approximately 45-60 minutes of flying time. With my light Chinook, if I minimize my control inputs I

can attain around 50 seconds of dead air time, respectable for such a small ship. Low rates and exponential can be used to keep flying smooth. Thermalling the Chinook is easy, keep the turns flat and slow in weak lift. In strong tight lift, the Chinook will out climb most anything else in the air. I have flown many 5 minute plus thermal flights with my Chinooks.

Launching the Chinook is probably best described as similar to throwing a softball. You start with your arm straight to the ground with the Chinook in your hand (palm facing your thigh). Next, rotate your shoulder straight backward. Then, quickly bring your arm forward. You can release the Chinook with your arm straight out in front of your, or somewhat over your head (depending upon where you want the Chinook to end up after launch). You should be able to launch the Chinook to any part of the sky, allowing you to tactically position yourself into other pilot's thermals.

If thermalling is not your cup of tea,



the Chinook is quite nimble, and will perform aerobatics very well both on the slope and while thermalling. Loops and rolls are simple with this plane, and rolling circles come very naturally as well. Without a rudder, it won't do a traditional stall turn, but it will do a neat tail slide that you can go to inverted, as soon as it flops down, and fly away upside down! ■

Kit Name	Goblin
Manufacturer	Thermal-Gromit Works
Contact Info	www.tgworks.com
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Wing Span	34 inches
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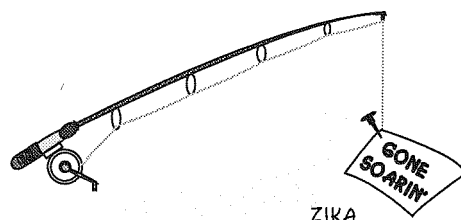
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www.alltel.net/~mwsc

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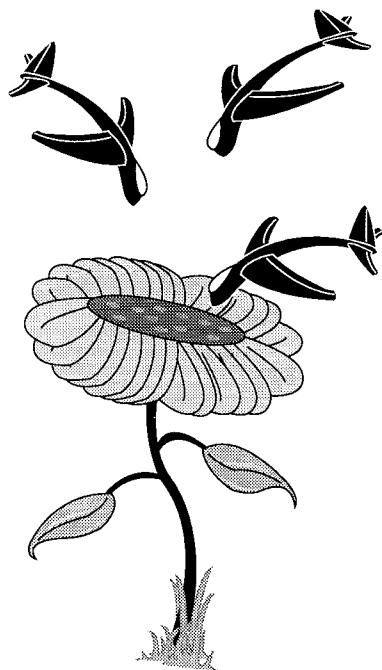
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ZIKA

Old Buzzard Goes Flying, the groundbreaking video on thermal flying technique, has been revised and re-edited, and is now packed with even more solid information and know-how on achieving that goal of ALL soaring pilots... to stay up until YOU are ready to come down.

This 55 minute video, based on the Old Buzzard's Soaring Book (which, unfortunately is no longer available), by Dave Thornburg, is packed with animation, graphics, and live flying footage... and is narrated by the Old Buzzard himself. You can learn from Dave's decades of experience, and confidently search out lift. Thermal flying does not have to be a matter of luck. Dave explains his "River of Air" analogy for understanding micro-meteorology. Learn the strategies and techniques to track down those wily thermals... and use their energy to keep flying.

The new Second Edition video has lots of new animations, new graphics, and new flying footage, to improve your thermal flying skills. Learn conventional thermal flying from a winch or high start.... AND hand launch thermaling as well!

\$24.95 for the NTSC (American video format) version... or \$29.95 for the PAL (European video format) version. Order today!

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Soaring Stuff

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<http://www.soaringstuff.com>
 E-Mail - info@soaringstuff.com

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.

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/month and are limited to a maximum of 40 words. 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. If you have items that might be hard to sell, you may run the ad for 2-3 months.

For Sale - Business

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

Reference Material

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

BBS/Internet

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



International Scale Soaring Association

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

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

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

T.W.I.T.T.

(The Wing Is The Thing)

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

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

Sailplane Homebuilders Association (SHA)

A Division of the Soaring Society of America



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

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

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



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

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

Send for your aspirant form, today:

League of Silent Flight

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

<http://www.silentflight.org>



The Vintage Sailplane Association

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

Vintage Sailplane Association
1709 Baron Court
Daytona, FL 32124 USA



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

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

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

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

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

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

The Soaring League of North Texas
Presents
TEXAS NATIONAL TOURNAMENT

TNT
2002

The SOARING LEAGUE OF NORTH TEXAS will once again host the TEXAS NATIONAL TOURNAMENT. This will be the eighteenth TNT. It will be held at the DALLAS RADIO CONTROL CLUB field in Seagoville, TX which is just southeast of Dallas. It will be held on May 3rd, 4th and 5th, 2002.

Events for the meet will be Hand-Launch sailplane, RES (rudder, elevator, spoiler) sailplane and Unlimited-class sailplane. Hand-launch and RES will be flown on Friday with HL in the morning and RES in the afternoon. Open-class will be flown on Saturday and Sunday. There will be awards for Saturday and awards for Sunday with the overall TNT Champion trophy going to the Expert class flier with the highest combined score for Open class on Saturday and Sunday.

There will be expert and sportsman classes for Open-class sailplane.

Contest directors will be:

Pancho Morris Unlimited Class
2715 Eastbrook Dr.
Mesquite, TX 75150
972 681-1098
e-mail: cho4853mor@aol.com

Jim Truitt R. E. S.
1618 Mapleton Dr.
Dallas, TX 75228
214 327-4441
e-mail: JTr8436ama@aol.com

Lynn Williams Unlimited Class
9533 Losa Dr #2
Dallas, TX 75218
214 321-3005
e-mail: tooth@hawkpci.net

Tim Bennett Hand launch
138 Sandy Oak Ln
Coppell, TX 75019
972 462-0784
e-mail: timben@swbell.net