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

*Radio controlled*

THE JOURNAL FOR R/C SOARING ENTHUSIASTS



# R/C SOARING DIGEST

Radio controlled

## THE JOURNAL FOR R/C SOARING ENTHUSIASTS



### WHIGAM GW-7 OVER UTAH

One of a kind, the cover features Dave Sanders' Whigam GW-7 at Soar Utah 2000, over Labor Day weekend. Steve Savoie, in his column "Short Cuts", reports on Dave's unique design.

Photography by Joe Chovan, North Syracuse, New York.

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

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### RCSD Staff

Jerry Slates - Editor/Technical Editor  
Judy Slates - Managing Editor, Subscriptions  
Lee Murray - RCSD Index/Database  
(available on-line)  
Bill & Bunny Kuhlman - RCSD Web Masters

Please address correspondence to:

**Jerry & Judy Slates**  
R/C Soaring Digest  
P.O. Box 2108

Wylie, TX 75098-2108 U.S.A.

(972) 442-3910, FAX (972) 442-5258

e-mail: rcsdigest@aol.com

<http://www.halcyon.com/bsquared/RCSD.html>

### Feature Columnists

Scott Gradwell, Bill & Bunny Kuhlman (B<sup>2</sup>),  
Robin Lehman, Lee Murray, Tom Nagel,  
Mark Nankivil, Dave Register, Dave Sanders,  
Steve Savoie, Jerry Slates, Gordy Stahl

### Artwork

Gene Zika is the graphic artist  
who designs the unique ZIKA clip art.

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

**Complete RCSD Index, 1984-1999**



### Mystery Interference

Over the years, we've noted that some radio channels experience interference problems at various locations. For example, a recent newsletter from the Central Arizona Soaring League (C.A.S.L.) in Arizona says that channels #16 and #17 have experienced a problem at Rodeo Park and to, "Use at your own risk." While but one example, the reason for the problem could be one of many, and some reasons may only be relegated to the "X" Files!

Needless to say, with all the time, energy and money invested in our radio and sailplanes, the last thing we need to experience is interference. Right?

In the April 2000 issue of *RCSD*, Gordy Stahl, our traveling reporter, discussed frequency control. Most of us know how that works, and Gordy did an excellent job explaining why "Sailplaners do it different!"

In the November 2000 issue of *Model Aviation*, "Safety Comes First" by Gary A. Shaw, there is an e-mail message on page

56 from Jim Busk. The subject is mystery interference. This interference was intermittent, skipping around from channel to channel. Jim explains how he finally identified the source, and what it took to get the problem fixed.

In this unusual case, the interference was caused by old insulators from electric power lines. For anyone experiencing this sort of problem at a local field, you might want to read what Jim has to say, and see if you think it applies to your field.

Since most notes usually specify specific channels experiencing problems, as opposed to all channels, we doubt if this problem will apply to most of you. However, we should be most interested in hearing from any of you that have identified an interference source and resolved it to your satisfaction. We'd like to share your findings with the other readers of *RCSD*.

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



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A MONTHLY LOOK INTO THE WORLD OF SAILPLANE ENTHUSIASTS EVERYWHERE

*R/C Soaring Digest (RCSD)* is a reader-written monthly publication for the R/C sailplane enthusiast. Published since 1984, *RCSD* is dedicated to the sharing of technical and educational information related to R/C soaring.

*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.

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*R/C Soaring Digest*  
P.O. Box 2108  
Wylie, TX 75098-2108 U.S.A.  
Voice (972) 442-3910  
FAX (972) 442-5258

e-mail: [RCSDigest@aol.com](mailto:RCSDigest@aol.com)  
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## Jer's Workbench

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P.O. Box 2108  
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(972) 442-3910  
RCSDigest@aol.com

### Bowlus Baby Albatross - Part VI

It's been a long time but, after many weeks, the strip planking on my Baby Albatross is complete. Although strip planking is usually easy to do most of the time, I had a few problems with the construction on this model. Most of the problems were not with the model itself, but rather were of my own doing.

In the past, when building a model such as the Baby Albatross, I would have done the strip planking using balsa wood, or even spruce wood. Then, it would have been stained with mahogany. However, the original Baby Albatross was built with mahogany plywood, so I *wanted* to use mahogany on the model. Using a stain just seemed too easy!

Intending to skin the model with real mahogany wood, I visited the local lumber yard and found a mahogany plank, 1x8x72 inches, for \$17. Happy with my prize, I raced home, set up the table saw and bandsaw, and commenced hacking out a handful of 1/8x3/8x30 inch mahogany strips.

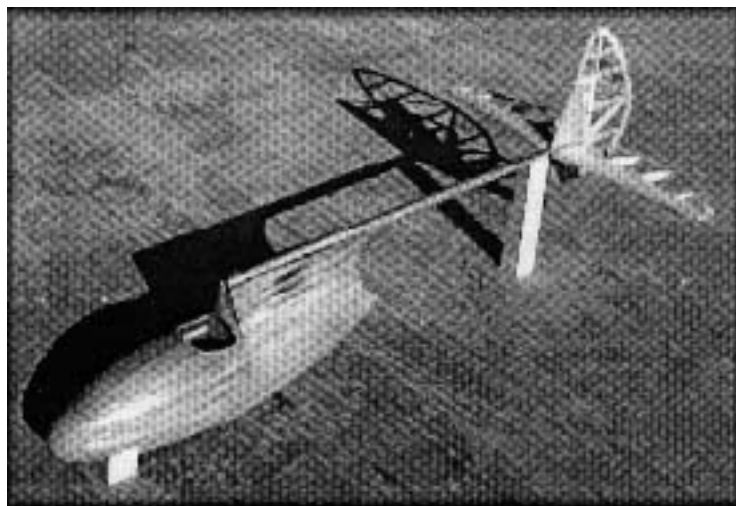
The first couple of mahogany strips were easy to apply as I began planking the Baby's fuselage, probably because I found an easy place to start. But, as I worked my way around the more complex curves, the mahogany began to break.

Now, I knew that I could soak the strips in a bucket of 50% water combined with 50% ammonia, thereby breaking down the fibers in the wood so that they could be bent without breaking. But, for some reason, the water and ammonia mix changed the color of the mahogany strips. If the change had left the color a dark brown, I could have lived with that. But the color was almost **black!** Since that was unacceptable, I had to give some thought as to how to proceed.

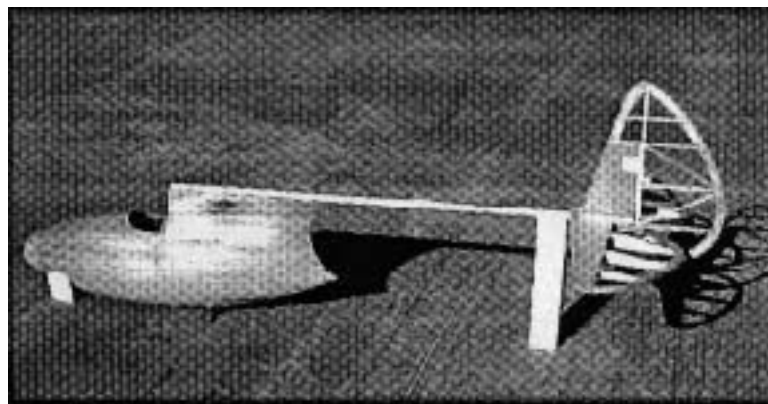
Taking a real close look at the mahogany strips that I had hacked out, I found that the grain was as shown in figure A. Studying what was left of the \$17 mahogany plank, I located a section where the strips could be cut with a straight or vertical grain, as shown in figure B.

Wouldn't you just know it! The new, straight/vertical grain mahogany strips could bend and twist easily into place, with no difficulty whatsoever.

Moral of the story? Don't get in a hurry and hack things out like I did. I got lucky and had enough good wood left in the plank to finish the task, cutting some really good strips. ■



*Bowlus Baby Albatross strip planking complete. More sanding is required. Note the seam around the removable hatch!*



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FIGURE A

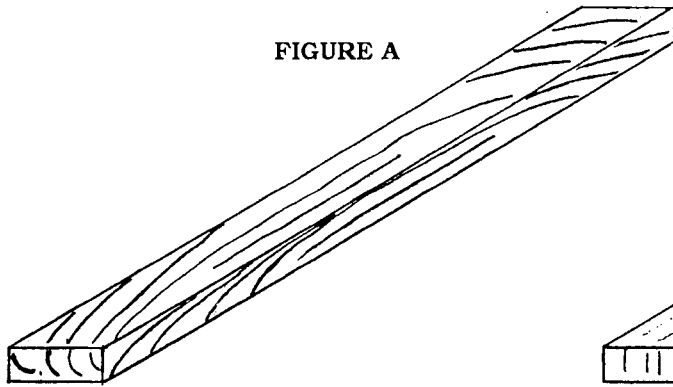
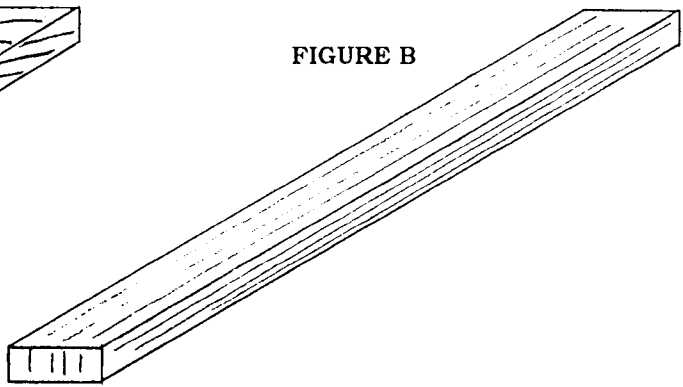


FIGURE B



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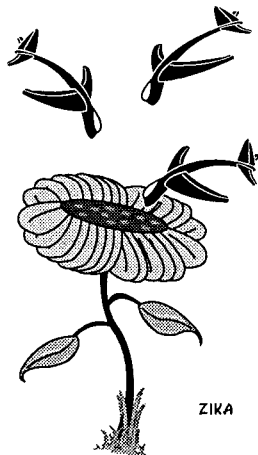
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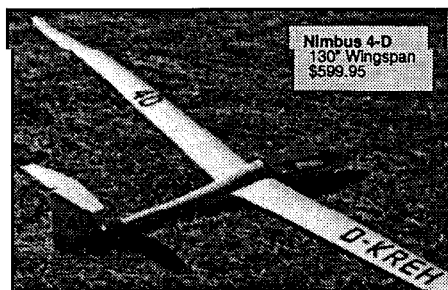
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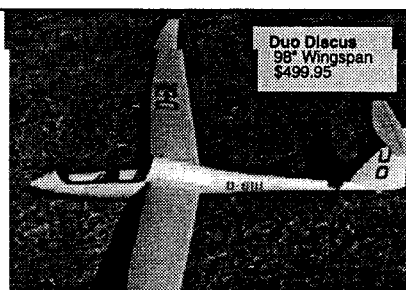
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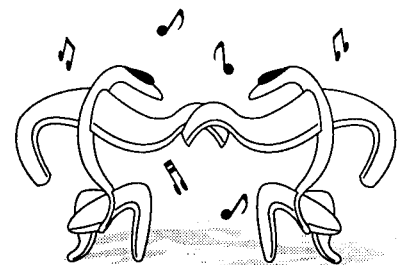


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# on the Wing



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## Trimming planks for slope flying

Plank planforms are incredibly easy to build, and are a delight to fly. Additionally, when given the appropriate airfoil and wing loading, they can be made to be anything from a light air floater to a speed demon. Not surprisingly, there are a number of planks which are designed for slope flying which seem to do well in a wide variety of conditions, from five knots up to 40 knots and more, without the need to add ballast. The "trick" is in how to trim the chosen airfoil.

Perhaps the easiest plank planform to imagine is the rectangle. In this case, a constant chord wing is attached to some sort of fuselage which houses most of the radio gear. Such aircraft have been built for many years using a few ribs, a spruce spar, and a fuselage of sheet plywood. More modern renditions are made of styrofoam and packing tape, or EPP foam. Sometimes the elevons are barn door affairs extending over the outer half of the wing, but more commonly they are nearly full span and of relatively narrow chord. If the goal is to be able to trim for a wide range of lift conditions, the latter set-up is preferable because the entire trailing edge is moveable.

RC aircraft of any kind must be set up on the ground to be pitch stable in the air. That is, the CG must be forward of the aircraft neutral point, and there must be some available aerodynamic downforce behind the neutral point to keep the nose up. Let's take these two points one at a time.

## CG and neutral point

The neutral point is generally considered to be at 25% of the mean aerodynamic chord (MAC). When computing this location for tailed aircraft, the horizontal stabilizer is taken into account. For our simple plank, which has a constant chord, the MAC is wing chord at the fuselage centerline. The neutral point is then 25% of the chord behind the leading edge.

If the CG is behind the neutral point, that is at a location greater than 25% chord, the aircraft will be unstable. There are "black box" methods of making such aircraft fly, but without such elaborate affairs the aircraft will not be flyable.

If the CG is at the neutral point, that is at 25% chord, the aircraft will be neutrally

stable. It will tend to continue flying at the attitude it has when the controls are set to neutral. Such aircraft are barely flyable. The pilot needs to be extremely attentive, and is usually inputting control surface changes on a continuous basis.

If the CG is in front of the neutral point, at a point less than 25% chord, the aircraft will be stable in pitch. When placed in a dive, the aircraft will recover by itself once the controls are neutralized.

Control input by the pilot is minimized. Best flying characteristics are usually obtained when the CG is between 22.5% and 15% MAC (static margin 2.5% to 10%).

## Rearward aerodynamic downforce

Airfoils used for plank designs must incorporate some amount of reflex, or the elevons of the completed aircraft must have some amount of up trim. Without that reflex or elevator trim, the airfoil will tend to follow its camber line and pitch forward. Additionally, the CG is in front of the neutral point and is applying a downforce to the forward part of the wing. To maintain level flight, there must be some downforce behind the neutral point - either airfoil reflex or elevon up trim.

The reflex applies a force which is directly related to air speed. A plank which has no flying speed and is simply dropped, will rotate nose down because the CG is in front of the neutral point. As speed increases, the reflex applies a larger and larger force to the aft portion of the wing. At some point the reflex will rotate the aircraft in pitch and bring it out of its dive.

## Obtaining level flight

At normal flying speeds, there is a balance between the forward CG

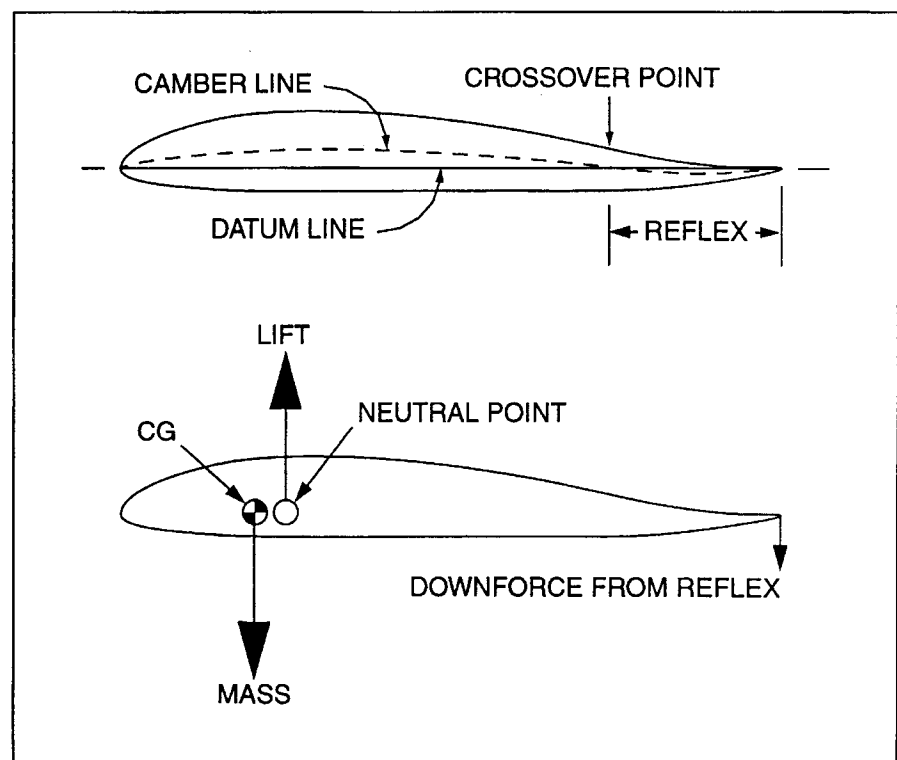
trying to rotate the nose down, and the reflex which is trying to rotate the nose up. Applying a small amount of down trim changes the pitching moment of the wing, reducing the normal down force or creating an upforce if the trim change is excessive. This causes the aircraft to rotate nose down, reducing the coefficient of lift and increasing the flying speed. Too much down trim causes a shallow dive and a higher sink rate.

Up elevator, on the other hand, increases the downforce on the aft portion of the aircraft and hence the nose rotates upward. The pitching moment is now more positive. The wing is operating at a higher coefficient of lift. The aircraft can be made to fly at a higher angle of attack and slower speed. The angle of attack can eventually be made to be great enough that although the lift is high, the drag is of such intensity that the sink rate begins to dramatically increase.

## Trimming for wind speed on the slope

If we take our simple plank out to the slope on a relatively calm day, we'll need to maximize the coefficient of lift, so we put in some up trim. If the winds are very calm, we may want to put in a great deal of up trim. What we find in the latter case is that the plank doesn't gain any height at all, but rather mashes to the bottom of the slope. The sink rate is astoundingly high. This is because the elevator down force is so great that it's adversely affecting the wing maximum coefficient of lift. (Remember, lighter aircraft can fly more slowly.)

On the same slope with a higher velocity wind, we will want to put in some down trim. We want the aircraft to fly faster, and



reducing the coefficient of lift achieves that goal.

In winds of very high velocity, the down trim required may be so great that the aircraft is obviously diving continuously as it flies across the face of the slope. In this case the overall sink rate is identical to the average upward velocity of the wind.

#### A couple of points to ponder

The trimming method we've outlined above utilizes elevator trim for flying in various conditions. This is equivalent, as mentioned previously, with changing the trim of a conventional tailed aircraft for the same changes in conditions. This is not a very efficient method of trimming for flying speed, however, as the sink rate is grossly affected. The conventional way of dealing with increasing wind speed is to incorporate a way to add ballast. Increasing the wing loading will increase the flying speed but have relatively little effect on the sink rate. We've heard of some pilots doubling and even tripling the weight of their aircraft through addition of ballast. Just make sure the wing can take the additional loads!

Reflex and elevator trim are directly related to the static margin. The greater the static margin the greater the required reflex or elevator trim. Rather than changing the elevator trim to compensate for slope conditions, we should be able to move the CG. A variation of the Panknin formula can be used to determine the CG location for various desired coefficients of lift. Such an arrangement was used in an F3B World Championships by one of the European teams some years ago. It was not a successful venture because the aircraft flew differently for each CG location, and there was no way the pilot could obtain consistent performance. But on a slope 'ship such a consideration may be a minor issue. The CG location can be either predetermined by

slope conditions before flight, or adjusted during flight by an additional servo.

#### Conclusion

For simple planks used for fun flying and combat, it seems like elevator trim is the best route, particularly when the entire trailing edge is moveable. But for high performance aircraft there are two trimming methods which deserve attention - use of ballast and a moveable CG. Both of these methods allow more optimized control surfaces. Adding ballast is a tried and true method of improving performance

in high winds without resorting to elevator trim. The incorporation of a moveable CG is still in the experimental stage, and we encourage inquiring minds with some technical expertise to investigate this possibility.

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



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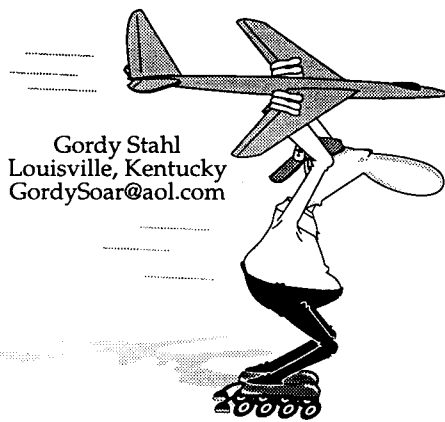
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# GORDY'S TRAVELS



## SLOP! Worn Servos or Linkage?? (& My 'Addiction')

*Atlanta, it was the best of times and the worst of servo slop I had ever seen in a molded ship's flaps...*

Since the airlines demand a Saturday overnight for reasonable ticket pricing, I found myself flying toward Atlanta, 10 pm, Saturday nite.

There I was totally engrossed in the latest installment of Harry Potter and the guy next to me says, "It's supposed to be a gorgeous day tomorrow in Atlanta." And, BANG!

My concentration was zapped away from Harry's danger, and my mind began checking off the things I might have forgotten to bring for soaring in the morning!

Armed, but not yet dangerous, with my new Sage Addiction 120", 7035, 36, 37 blended foil sailplane, I was itching to work on getting it trimmed out (Visalia only a few weeks off!). Mostly on my mind was why my plane was flying so rotten (at least according to my idea).

The week previous I was with Stan Koch in Nashville, testing it against another Addiction outfitted with a plain old 7037 foil. We had balanced both dead at 5", then did about 20 bungee launches into calm, buoyant evening air... And I found that the other guy's Addiction was on average, getting a minute more time regardless if I flew it, or the owner flew it.

My plane weighs 60 oz. and the other guy's almost 63 oz. Discussions of my results with Fred Sage brought up the theory that the plane might be flying too light for the foil choice, so I dug out my steel joiner rod (versus the aluminum) to see if a higher wing loading would get it up on step.

My reason for choosing this foil was the windier conditions I mostly end up flying in and the desire for a better penetrating foil. Atlanta's day of flying was to be the opportunity to test the 'heavier wing-loading' theory.

Now, I had been flying the 7035 foil happily for years on the Pelican, Psycho and various molded ships, and I knew it was my foil of choice. The way this plane was flying just didn't match up to my experience... However, all those planes were always around 70 oz.

The rod brought up the weight considerably, and while the motels I have been in since haven't had a scale to weigh it, I am sure it is in the 70 range. Fred felt that 66 might be optimum.

Well, guess what? It turned the plane into a thermaling robot. The lightest, tightest lift could be banked and cranked into with no tail-dragging ugliness. Rudder turns came alive and the penetration is now closer to what I had hoped for.

*But I digress!*

## The Atlanta group

Like most clubs, this club has endured the tendency to expand and contract, pending member's ages, and members kid's ages. The day I was there we had about 8 guys flying. There was an Ellipse, Molded Psycho, Pelican, Grand Esteem, and my Addiction, to name a few, so you can see a fairly sophisticated group of modelers.

It didn't take long, during a flying break, for the topic of Volz servos to come up (because of my friendship with Michael Volz). The guy with the Molded Psycho had some Micro Maxx on his flaps and he brought it over to show me that he had about 1/2" of servo slop on his flaps!

Checking his mounting showed that there was some movement being allowed by his mounting tape, but not enough to allow that much slop.

I had him engage his launch-flap setting and, with my finger, showed him that I could move one flap from camber all the way up to reflex... Easily overcoming the servo's 'holding' power!

He also mentioned that the plane had not

had a glowing reputation. In fact, it had been sold a couple of times within the club due to its poor flying performance, and a few crashes. All repairs had been done well and the airframe looked good and straight.

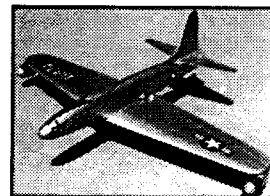
One complaint was wild launches that veered off to the right, regardless of tow hook location. So I asked him to launch it while I observed. The first thing I saw was the flaps coming off camber, and yes it veered right again and the launch height was poor. I know the Psycho Moldy and it is a world class ship... The problem was not the plane.

I flew it a few times and, after removing about an ounce of lead from the nose, the plane was flying "better than it ever had!" But, it was still too unbalanced for my tastes.

Next was the launching. Of course, with all

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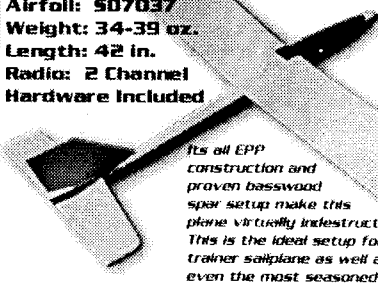
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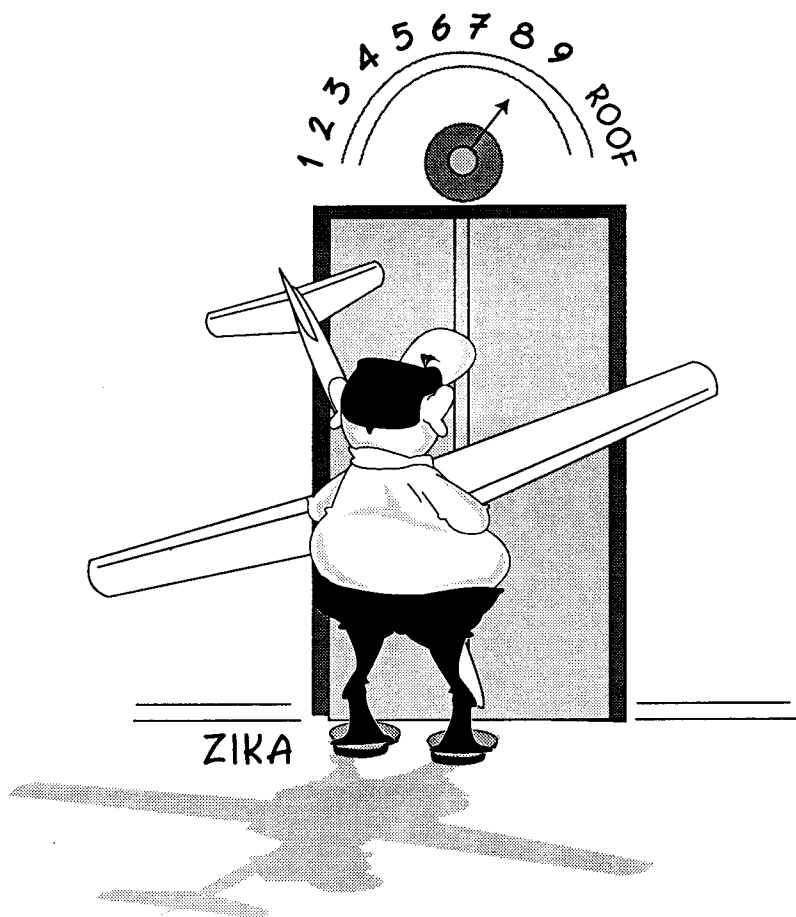
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that 'servo' slop, the wing's trailing edge was out of control, especially during launch loads. Yet with one simple change, I managed to take all of the 'servo' slop out and increased the holding power of the flap servos so that you couldn't move a surface from launch camber without ripping the servos from their mounts!

I want to make sure that you readers understand that, before my change, you could see the servo's arm moving at its output shaft; anyone seeing it would have condemned the servo for its lack of precision, and no one could argue you out

of that 'fact'. So, how did I instantly change that sloppy servo into the precision servo it actually is?

Simple geometry... The installer chose a 4 hole servo arm in order to 'get enuf' throw for 90% flap deflection, instead of using his travel adjust and servo arm positioning. The servo clevis was in the top hole, and the surface horn clevis was in the horn's lowest hole.

Any 'slop' (and all metal gear servos will have a minute amount of gear lash) is exaggerated by the distance the clevis is attached away from the servo. A small

amount at the shaft grows by the time it reaches the arms end. Volz created a special, beefed up, two-hole arm as the 'standard' arm supplied with his servos because he knows that world competitors need and desire high power and little slop, so I moved the servo clevis to the second hole. That doubled the holding power.

The surface-horn connection works in reverse. The longer the horn clevis connection, the greater the leverage the servo has on the surface, so I moved the clevis to the top hole.

We were all surprised at how tight things

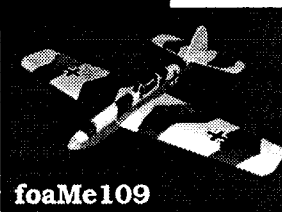
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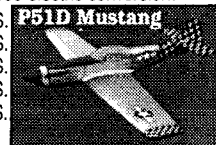
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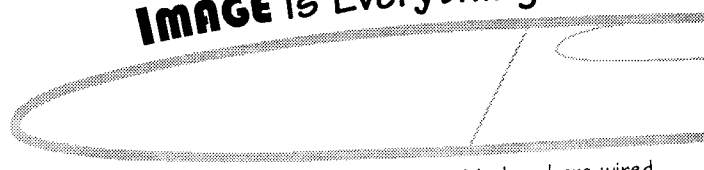


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got with this change, as I expected that the gears had been hammered frequently by flutter (This plane hadn't gotten a lot of respect in its time.), yet the surfaces were rock solid.

Now for the launch! It was no surprise when it went up like it was on rails, and now all it needed was to shift the hook back to where it belonged.

Needless to say, there was a very happy guy on the field that day, and that Psyko caught more light air than it had in a long time.

It would seem amazing that a club of outstanding, experienced builders and competitors didn't pick up on those things that I found, but I have the advantage of stealing great ideas from great modelers all over the USA, guys who have been through similar situations.

While it would seem that this 'redeemed' the Volz, more importantly it should be a hint for all of you who choose to fly the more economy brands of servos, in that you can get a lot more life and value from them by optimizing your installations. Economy servos aren't the same as those that are chosen by world class competition pilots; if they were, they would cost the same, but it doesn't mean that you can't get good service from them.

**Rule of thumb for best servo performance and surface tightness is this: Shortest servo-arm connection to get the job done and a surface-horn Clevis connection equal in length or slightly longer.**

#### **One note on servo 'strength' or holding power**

The flight-pack battery sends its power out on two wires. That power is used by all 6 servos, the wiring and the RX. Think in terms of 7 electric motors with propellers, all being fed by one battery pack. What happens to 6 of the motor's propellers if you stop one from turning? The juice that was being dissipated by the prop/motor you stopped is now available for the others and they speed up!

Your system's servos are no different. Try to overcome all 6 servos and none want to move; however, something in the system heats up as the power still wants to go somewhere. Move one servo against its will and the power builds in the others. There's no 'gate valve' to keep the power in the one to resist the force of you moving it.

So what's the fix for keeping all the power promised on the servos' boxes? 5 cells, right? Wrong.

Servos are often shown with a torque rating at 4.8V and 6v, but 5 cells is not 6v. As we know, a peaked pack will exceed 6v, but even at 6v, while the servo is 'rated' there, no 'life expectancy' rating is supplied at the higher voltages.

Stall a servo at 4.8v and its motor and amplifier get warm; stall it at 6+ volts and

its motor and amplifier get hot, real hot, fast!

Excess power is converted to heat, and wasted. Also, pack capacity is reduced. Secondly, your servo connectors take a beating, causing hidden corrosion and increased resistance, further reducing the amount of power available to feed your servos to their optimum performance.

Those 'expensive' servos have optimize gear trains, and extremely efficient motors/amplifiers to best use the power supplied in the 'average' airframes installation. Buzz words like 'metal' gears, ball bearing, or coreless motors, are mostly marketing tools to imply extra value.

However, an optimized installation, that takes advantage of arm to surface-horn geometry, pushrods that don't bind, and mountings that aren't susceptible to skin 'oil canning' or servo-body movement, will do more for you than any of those 'buzz word' implied values.

It was a good trip, a great time and the club 'meeting' afterward is a story all in itself!

Next stop, Parker Mountain, and the ultimate TD contest in the world, Visalia's Fall Festival of Soaring. Hope to see you there!

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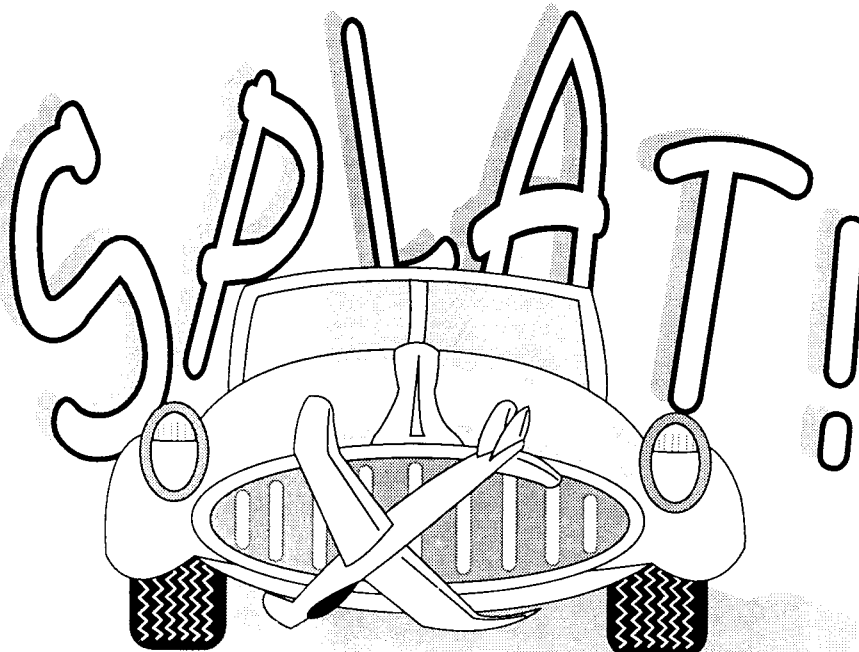
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ZIKA

# CROSS COUNTRY SOARING



Scott Gradwell  
Medford, Oregon  
rcpilot@cdsnet.net

## Cross Country Soaring VS. Full Size

Well, another month has come and gone, too quickly I would have to say. This month, I'd like to compare R/C Cross Country Soaring to that of flying full size.

I think in the modeling world, R/C Cross Country Soaring emulates full size soaring the best. I don't know of any full size pilots that try land at an exact second, or strap skegs to their sailplanes so they can plop their sailplanes down in the middle of a points target.

Also, can you imagine wedging yourself into a foam airplane and try to hit someone else in order to knock them out of the air? Therefore, I don't think foam combat has anything to do with full size soaring.

Rather, I think the people most likely to jump from R/C soaring to full size soaring would be R/C X/C pilots.

A modeling friend and copilot on my X/C team, DJ Buell, was able to take a lesson during a regional contest held at Siskiyou County Airport. I talked with the instructor and he said DJ picked flying right up and was able to solo very quickly. I am sure flying R/C modeling is the reason for this.

DJ stayed up over 2 hours, went to 11,000', and flew an ASK-21 almost the entire flight. He told me afterward that he might even consider selling a few models in order to continue.

I too made the jump from modeling to full size soaring. But in my case, it was from flying in a R/C Cross Country contest to flying in a full size Region 11 contest. It was a wonderful experience. All the people I met at the contest were just as friendly as R/C people and were willing to help and answer all my questions.

I entered the sports class flying a Schleicher Ka-6E. In sports class, each sailplane receives a handicap so sailplanes of differing performance can compete against each other. We had six days scheduled, but only flew four because of weather. These were the most intense and exciting days of soaring I have ever experienced. I was even able to apply some of what I learned flying R/C Cross Country.

On one flight, I was way down low, west of the valley I wanted to be in, and seriously considering landing out. I saw a small rock quarry and thought, "Well, if I was flying my SB-X/C that's where I would go." So, I headed that way, worked a thermal back up to altitude, and was actually able to complete the task.

If any of you are thinking about getting into full size soaring, go to [www.ssa.org](http://www.ssa.org), locate an operation close to you, and go for a ride. I'm sure you won't regret it.

Since I think R/C Cross Country soaring and full size soaring are very similar, occasionally I will be writing about full size soaring; I hope this is OK. Besides, if I can only write about R/C Cross Country soaring, I might run out of ideas too quickly.

Well, considering what I said earlier about other forms of R/C soaring, I better get back to work on my RnR Millennium. I am hoping to go down to Visalia and fly in the Thermal Duration contest down there. But don't expect to see me splat it into the ground for points; it was too expensive and, for me, there is something just unsoaring like about doing that. ■

For ordering info. on books shown below, see new product listing on page 22

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# TECH TOPICS

Dave Register  
Bartlesville, Oklahoma  
regdave@aol.com

## Programs for Designing Sailplanes

Over the years, *RCSD* has carried a great many articles devoted to soaring design and construction. The excellent series by Martin Simons covered many aspects of sailplane design. Bill and Bunny Kuhlman have spelled out the considerations for tail-less flight. Just about every issue contains some information on structures and/or materials.

Let's assume you've read all of these articles and have been bitten by the 'do-it-yourself' bug. You've got some great ideas that you want to try and now it's time to go for it on your own. Break out the scratch pads and pencils and start drawing.

After several days of enthusiastic tracing, erasing, re-drawing, more erasing, etc., you've got a bunch of crumpled sheets of paper that are so smudged you can't tell what's really on them anymore. Up until a few years ago, this was the method used on the Register drawing board. I really LOVE to scratch build, but I really HATE to draw

up the plans.

About two years ago, I started collecting programs to help with this task. After going through a modest number of applications, including several I wrote for myself, I'd like to share a few comments on a couple of tools I've found particularly helpful when the 'do-it-yourself' bug bites pretty hard.

As a starting point, a good CAD (Computer Aided Design) program is hard to beat. A key tool to use is something that fits on your PC and doesn't cost an arm and a leg. The one that I've found to be particularly useful is QuickCad by Autodesk (Release 7). A friend of mine came across this program about 6 months ago and it's been a fantastic tool to use.

Although QuickCad is a good general purpose CAD tool, it's a lot more convenient to carry out some functions in a program specifically built for sailplane folks. Top of my list is Chuck Anderson's Model Design (Version 8) program. This is a very powerful tool for laying out wing planforms for either foam cutting or conventional construction. Chuck origi-

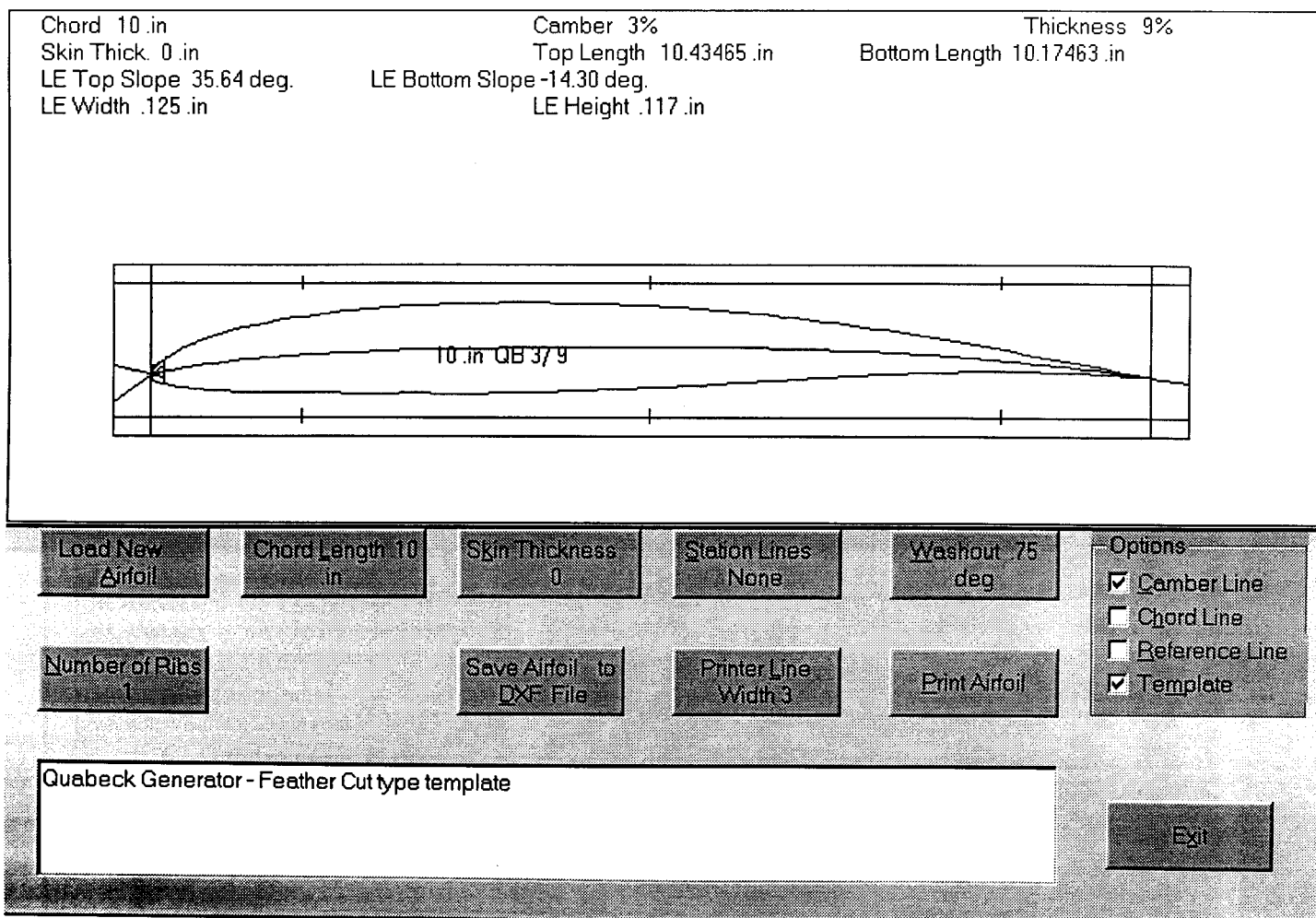
nally designed this for DOS and has migrated it to a true Windows format using Visual Basic. A particularly useful feature is the ability to export airfoils and wing layouts to a generic CAD format which my other program can read very nicely.

Finally, once you've finished your design work, how do you electronically distribute your creations? One of the most usable and accurate platforms is an Adobe Acrobat file (pdf format). Unfortunately, the full Adobe system will set you back a couple of hundred bucks. If all you need is the driver for output format (the reader is free at the Adobe website), a third party supplier that works very well is the ZEON DocuCom PDF driver available from the ZEON website.

All of these programs are very reasonably priced with the total package winding up around \$150 for all three. So you can still afford to buy material with which to build the creations you've designed.

Let's start with Chuck's Model Design and Airfoil Plot programs. These come as a two floppy disk set and install the same as any other windows program. Once installed, a

Figure 1: Template View In Model Design 8



generic icon is created on your Windows program list. In Windows 98, a right click on the ModelDesign8 icon will let you send it to your desktop as a shortcut.

When you first run ModelDesign8, a window opens on your desktop with a number of drop down menus. The first of these, Plot, contains most of the items you'll use. The first element in the plot menu is an airfoil template generator. Clicking on this item launches the airfoil section.

Airfoils are selected either from a library of files Chuck supplies in his 'AIR' format or from one of several airfoil generators. Files may also be read in the format used by both Drs Eppler and Selig (COR and DAT extension files). The differences are subtle and can best be seen by loading these various coordinate files in a simple text editor (like NotePad). Airfoil generators that Chuck supplies are NACA 4-digit, NACA 5-digit and Quabeck sections. There's also an airfoil editor for modifying surfaces if you're bold enough to strike out on your own.

Once an airfoil has been selected, the chord length is required. Other buttons on the

airfoil screen allow choosing skin thickness, number of ribs, washout, etc. There are several check boxes for reference lines. Checking the box for templates brings up a template screen for either single or double templates with kerf correction if needed. An example of a screen-view of the template is shown in Figure 1. The entry and exit are tangent style with a 45 degree limit (nice touch!). The templates generated from this section are designed to meet the requirements of the Feather Cut system but are also suitable for any two template hot wire system.

There's also a neat little button on this screen to export the file to a DXF format. This is a generic CAD format that most CAD programs can read. I haven't seen any other template programs that have this capability and it's VERY handy for getting the root rib into a form that can be projected onto a fuselage design.

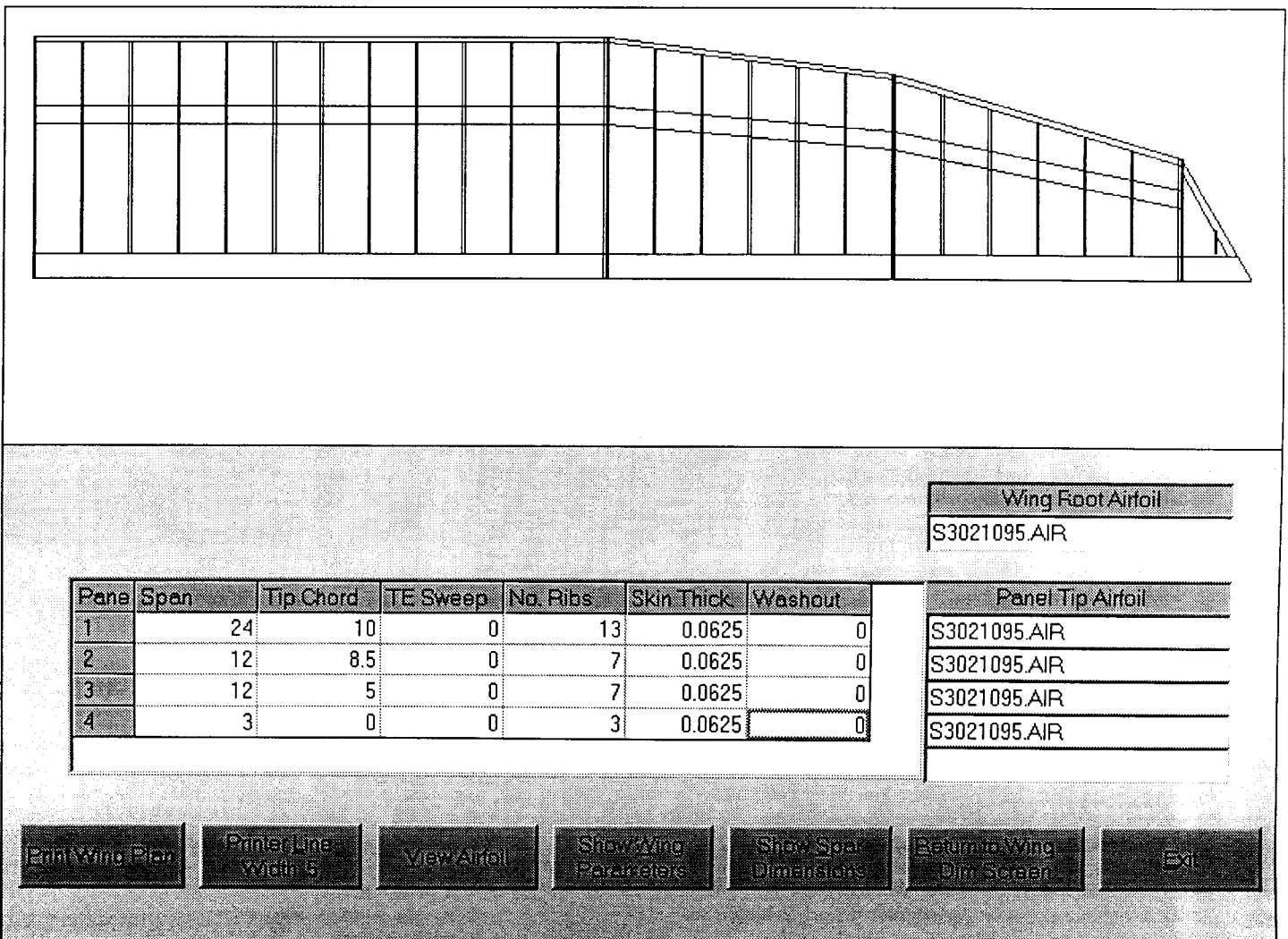
Printing the airfoil will give a nice print out on your default printer in the format you selected (template, reference lines, etc.). The print line width is settable from the program and the print resolution is much higher than the screen resolution.

Another neat feature of the Plot menu is the ability to overlay as many as three airfoils to compare contours. This is a very nice comparative feature and gives you a quick look at different sections. Chuck has also included options for circle and ellipse templates as well as a capability to generate trigonometric angles. The latter is particularly useful when setting up templates for polyhedral wings.

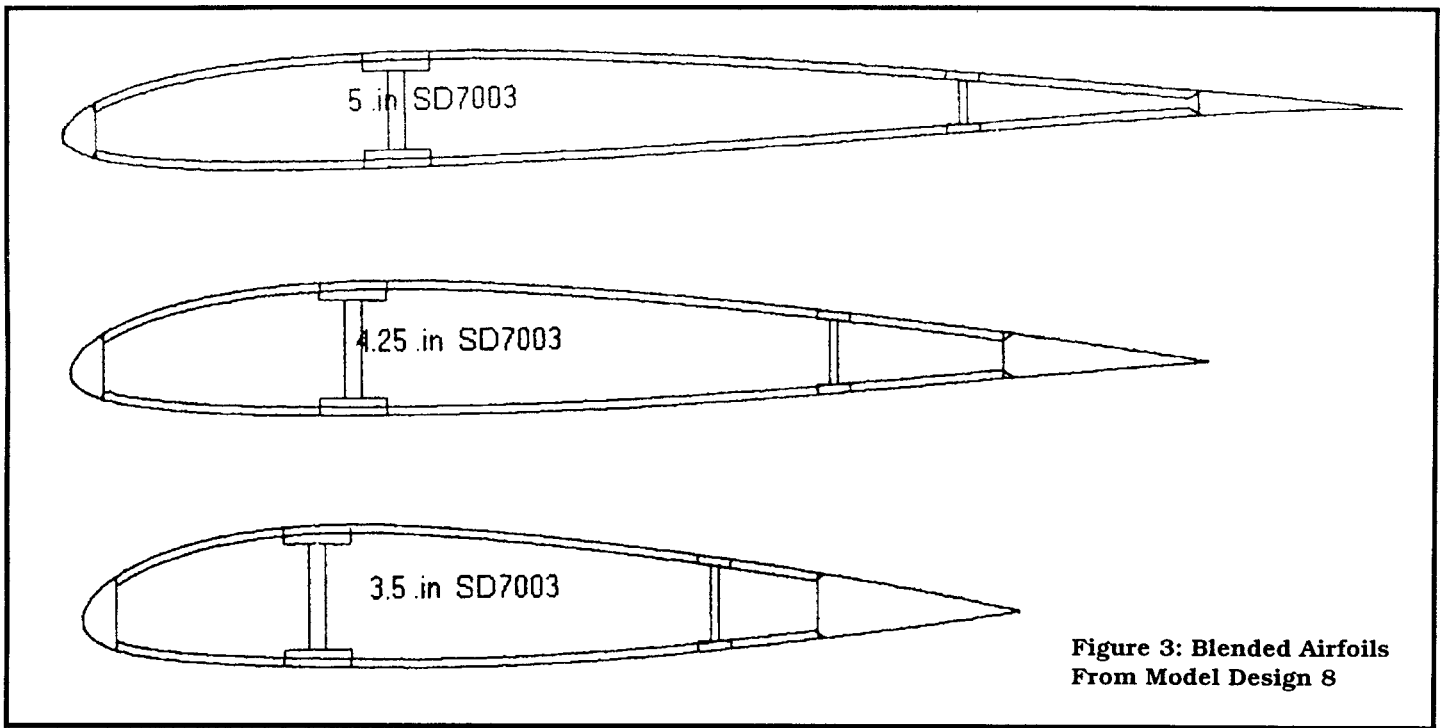
The unique capability of Model Design 8 is in the Design option. This handy tool allows the designer to lay out up to 5 panels in a wing and specify sweep, chord length, airfoils, spar locations, etc. If a built up wing is selected, this section allows different airfoils at each end and then automatically calculates the blended section at each of the specified rib locations. Now that's a VERY useful trick if you like to build with balsa and spruce. An example of a 4 panel wing supplied with the program is shown in Figure 2.

As an example of the program capabilities, I put together a built up HLG wing with different airfoils in the tip panel (SD7003 at the root, NACA 24015 at the tip). Two spar locations were also chosen, one with a

**Figure 2: Planform Layout in Model Design 8**

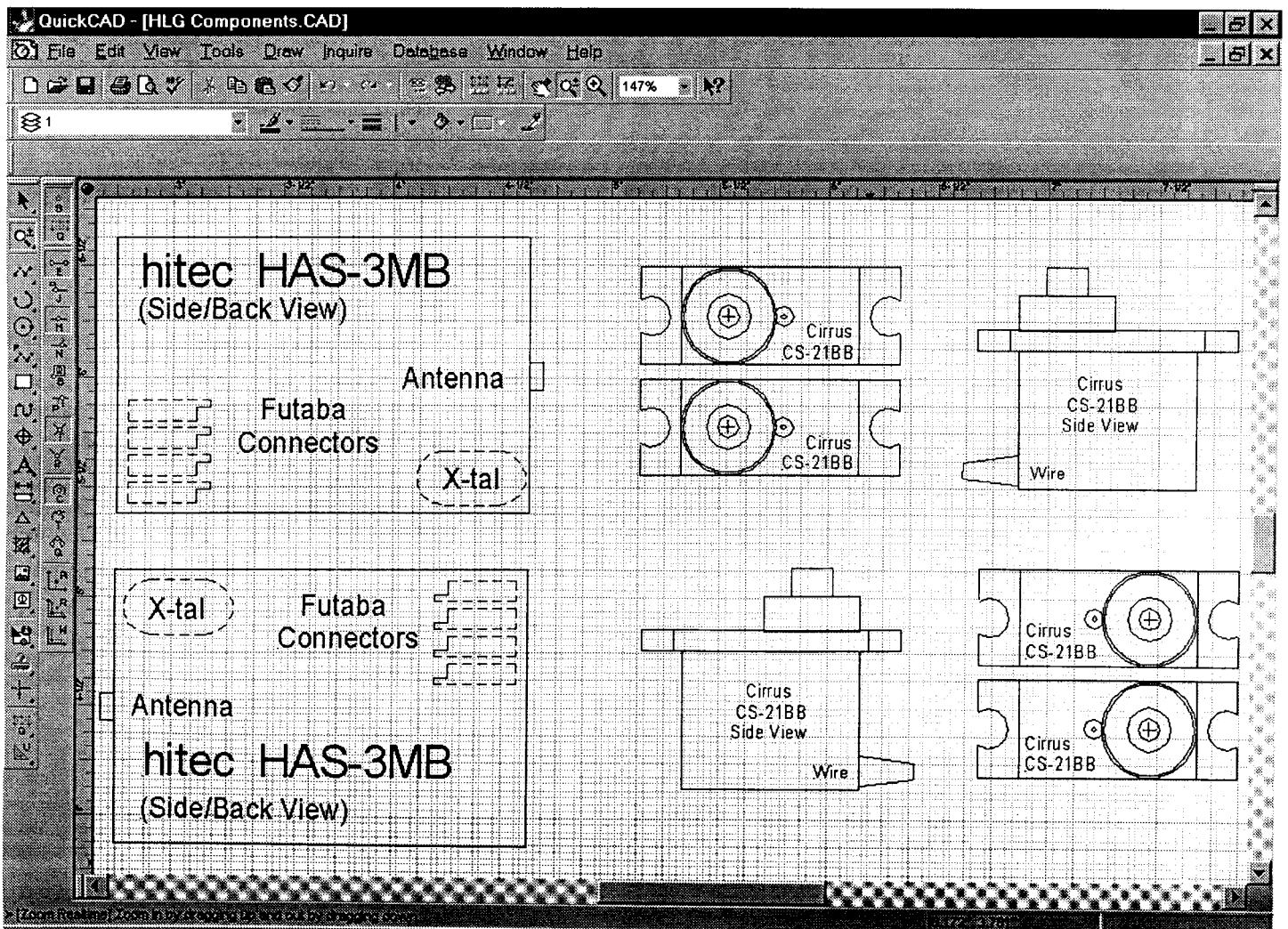






**Figure 3: Blended Airfoils  
From Model Design 8**

**Figure 4: Flight Pack Component Drawing in QuickCAD**



shear web, the other without. The airfoils were not chosen for practical purposes but to illustrate the blending capability of the program. In Figure 3, the root, mid-span and tip sections are shown. All templates are noted by the root chord name, but it's very obvious the blending is smooth and accurate. (These images were printed and then scanned back into my computer. The surface irregularities are due to scanner resolution and conversion among image formats.)

The entire wing planform can be printed to any scale. The default page size is 8.5 inch x 11 inch, so if full scale is selected, multiple pages will be printed for taping together. Another nice touch is labeling of each page so you don't get out of sequence (important for long, non-tapered panels). You can go into your printer setup (outside the program) and specify other paper sizes that your printer will accommodate.

One thing to keep in mind while using this program, each entry in the design grid can only be accepted with the 'Enter' key. These days it's easy to mouse-click or tab from box to box. However, this program requires the specific 'Enter' keystroke to accept the data.

Since this is appearing in *RCSD*, an ad for Model Design 8 appears elsewhere in the journal. Current pricing is \$50 and Chuck Anderson can be reached by e-mail at [canders@edge.net](mailto:canders@edge.net) for additional information. My version (8.04) had a few bugs in one of the screen plot areas and the Quabeck generator. Chuck has released version 8.05 which seems to have fixed things. The windows interface for this program is a little different than what you might see for a Microsoft developed product but after a couple of sessions it becomes more intuitive as you understand the design goals of the author. This handy program is certainly well worth the modest purchase price and I find it more worthwhile every time I boot it up.

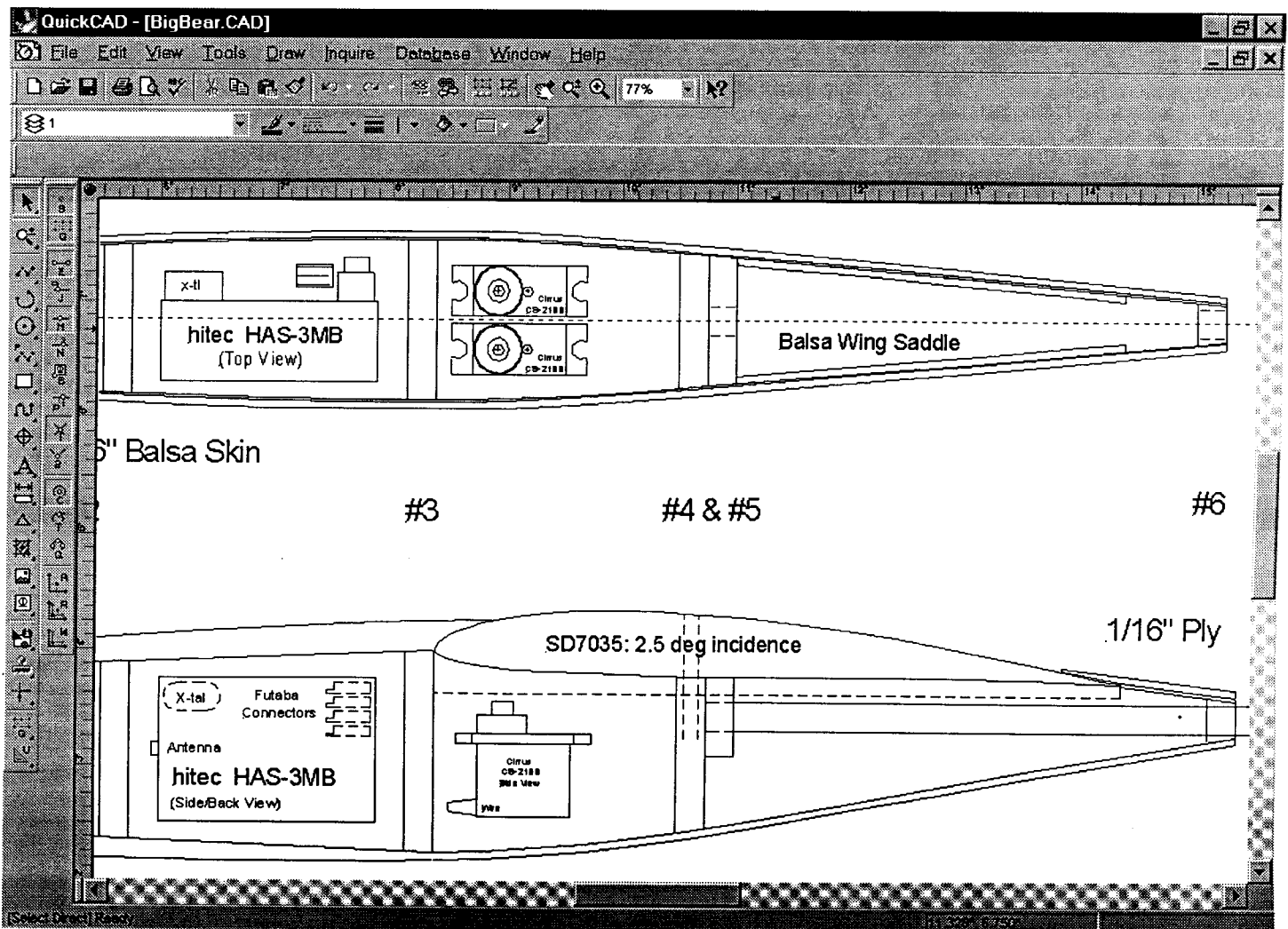
Having generated an airfoil and/or planform and exported it in the DXF format, a next step might be to proceed on to a fuselage design using the airfoil developed in Chuck's program. For this step I use QuickCad by AutoDesk. Purchase price at Staples was \$60 and it has all the CAD capability I can ever use. Professionals may need more than this package offers but I've pushed pretty hard in this program and haven't found anything I can't do yet.

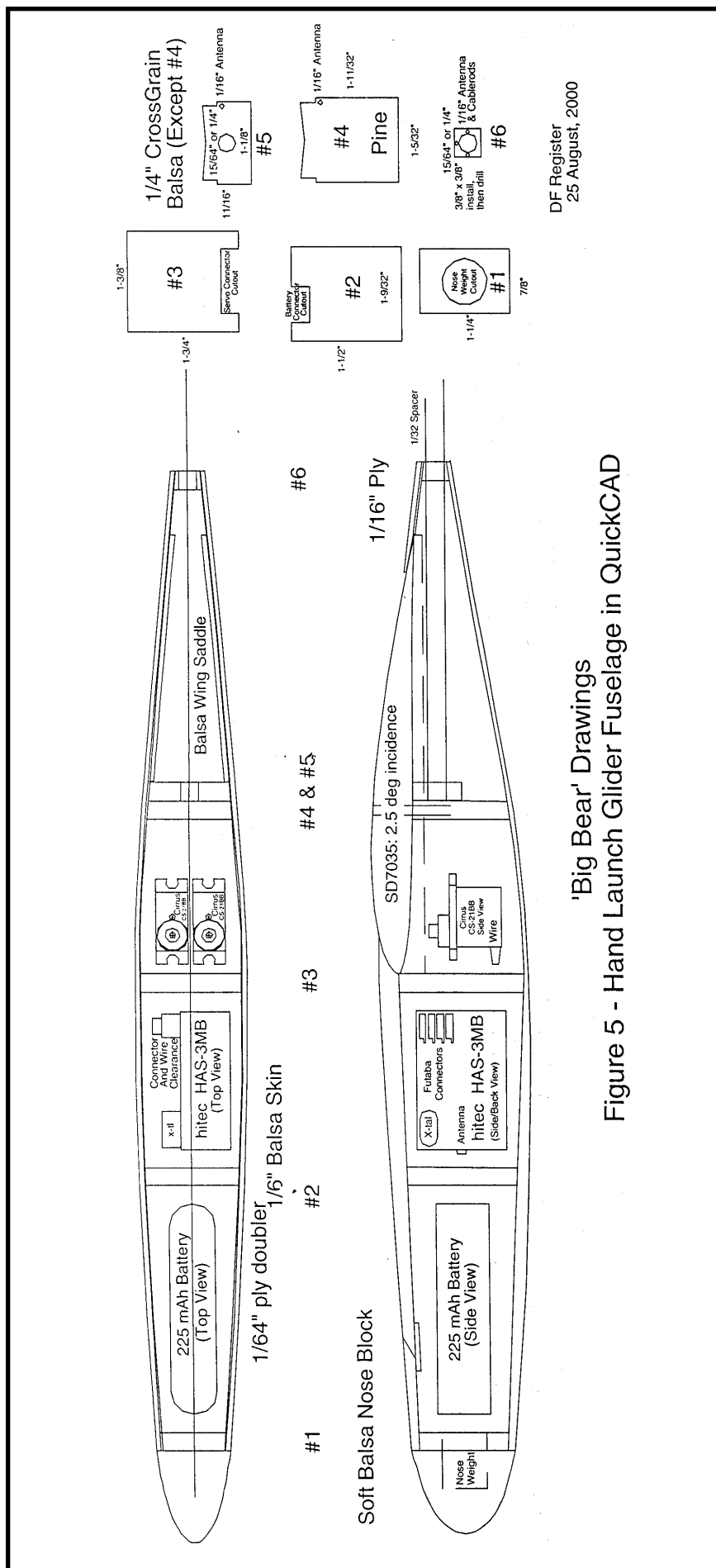
In addition to 2D and 3D plots, QuickCad allows for extremely high resolution grids. (I've used 1/64" fairly often for HLG fuselages.) All the normal line, circle and other shape tools are readily available on the tool bar(s). A great feature of this program is its ability to almost infinitely magnify any drawing. This allows an incredible level of detail and accuracy, but still lets you zoom out to get the big picture and then come back in to fill in the details wherever you want.

A particularly handy feature is the ability to create 'entities' from your own drawings. For a recent HLG design, I created multiple views of all the components (servos, receiver and battery) and then grouped each drawing set to create a single image of each component which could be moved around wherever needed. An example of the design drawings for the servos and receiver is shown in Figure 4. In each case, the normal drawing tools were used to create the image to the exact dimensions of the part. Then the entire image was highlighted and grouped together using an image editing function (available quite nicely with a right mouse button click).

With the various 'entities' for the radio set

**Figure 6: Expanded View of HLG Fuselage in QuickCAD**





now defined, it was very easy to lay these out in a logical order and then simply draw the fuselage outline and formers around them. A full diagram view of the resulting CAD file is shown in Figure 5 while a closer view of some of the details is shown in Figure 6. These images are simple screen captures of the drawing window.

Having set up the fuselage, the wing outline (from ModelDesign) was imported and captured as an 'entity'. It was then rotated by the desired decalage angle (2.5 degrees in this case) and then located aft of the main fuselage former. This allowed the rear of the fuselage to be contoured for the wing as well as generating a good reference line for the tail boom.

In addition to all the normal features expected of a CAD program, QuickCad provides several output styles, including exporting the drawing in windows metafile format (WMF). This is a very accurate and compact method for creating drawing files within the Windows environment. It's not

as portable as GIF, TIF and JPG files but it is much higher resolution (vector graphics as opposed to compressed bitmaps in the other formats). Many graphics programs can read WMF files and from there you can convert to the lower resolution formats. (ThumbsPlus is a particularly good file conversion and viewing program.)

The comments thus far merely highlight a few of the many capabilities to be found in QuickCad. If you're interested in taking the plunge into a CAD program, the cost and flexibility of this one make it real easy to try it out. As I continue to explore the capabilities of QuickCad (setting line angles and lengths, for instance, for highly accurate spars and longerons), I'm convinced the bang for the buck is very high. It's a great tool for the scratch builder and I'm wondering more and more how anyone did engineering drawings prior to the availability of these types of tools.

Finally, let's highlight a very simple add-on for exporting your design in a format that

can be accurately read by anyone. After trying a number of file options, the best way I've found to do this is with an Adobe Acrobat file format. As mentioned above, this is a very expensive option and most of us don't need the full Adobe suite of programs which contains the pdf file driver. So a little searching on the web found a very useful utility by ZEON Co. which generates Adobe output files. Cost is a little higher than I'd like (~ \$40) but it's a lot less expensive than the full Adobe suite and does exactly what I needed to do.

You can download an evaluation copy from the ZEON website. This has all the functionality of the full driver but has a watermark that prints on all output from the program. When you pay the registration fee, ZEON will e-mail (or snail mail) a registration number that will remove the watermark. Once installed, the DocuCom driver looks like any other printer for any of your windows applications. I've run it in every Office program I've got as well as

Pages 16 & 17 modified from original copy to fit PDF format.

AutoCad and several graphics programs. They all work just fine.

This idea is not original with me but has been used by the Charles River RC club to distribute plans for a HLG. Several clubs (SLNT and PSS to name a few) use PDF files to distribute their newsletters by e-mail (or downloadable from their websites). Take a look at the 'Terminator' HLG at the Charles River web site for an example of how a PDF driver can make electronic distribution of plans very easy for you and your club.

That's it for this month. Hope these tools work well for you. Please drop an e-note if you have questions, comments or a useful program that might add to this list.

#### Resources:

Model Design 8 by Chuck Anderson  
PO Box 305  
Tulahoma, TN 37388  
canders@edge.net  
931-455-6430

QuickCad, Release 7  
Millennium Edition  
<http://www.autodesk.com>

ThumbsPlus  
Cerious Software, Inc  
1515 Mockingbird Lane, Suite 1000  
Charlotte, NC 28209  
704-529-0497  
<http://www.cerious.com>

ZEON DocuCom PDF Driver  
<http://www.zeon.com.tw>  
Charles River R/C Club  
<http://www.charlesriverrc.org/>  
Terminator HLG (pdf file format plans)  
<http://www.charlesriverrc.org/articles/terminatorhlg/terminatorhlg.htm>



## 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.  
**Chuck Anderson, P. O. Box 305, Tullahoma, TN, 37388** Phone 931-455-6430  
email [canders@edge.net](mailto:canders@edge.net)

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## X · X Successes

*Latest results on worldwide contests  
with VOLZ Servos:*

**World Speed Trials '99** Gliders:  
1<sup>st</sup> place, 2<sup>nd</sup>, 4<sup>th</sup> with VOLZ Micro-Maxx  
and 0.4" thin Wing-Maxx Servos

**F3J-Euro Team Championship '99**  
Gliders: 1<sup>st</sup> places in Senior- and Junior  
class with Micro-Maxx / Wing-Maxx

**F5B-Electro. Euro Championship '99:**  
Six (6!) out of 10 Best use Wing-Maxx

**JET- World Championship '99:**  
2<sup>nd</sup> place with Micro- and Wing-Maxx

**F3B- World Team Championship '99**  
Gliders: 1<sup>st</sup> and 2<sup>nd</sup> place with Micro-Maxx  
/ Wing-Maxx Servos.

**F3B-Eurocontest Tour '99** Gliders:  
1<sup>st</sup> and 2<sup>nd</sup> place -> Micro- / Wing-Maxx

**German F3B-Championship '99** Gliders:  
1<sup>st</sup> place with Micro- / Wing-Maxx

**F5B-600 Electro.Eurocontest-Tour '99:**  
2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> with Wing-Maxx

**F3F-Speed World Record 2.000** Gliders:  
flown by K. Newton, UK, -> Wing-Maxx

**F3J-World Championsh. 2.000** Gliders:  
1<sup>st</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 6<sup>th</sup> and 9<sup>th</sup> place & 1<sup>st</sup> place  
Junior Team with Micro-/Wing-Maxx

**Viking Race 2.000** Gliders: 1<sup>st</sup> place & 1<sup>st</sup>  
Team ranking with Micro- /Wing-Maxx

**F5B-Electro.World Champ. 2.000:**  
1<sup>st</sup>, 4<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup>, 12<sup>th</sup> .....place with  
0.4" VOLZ Wing-Maxx Servos

### Congratulations!

For years our **Micro-Maxx** Servos have  
been the choice of winning World-Class  
contest flyers.

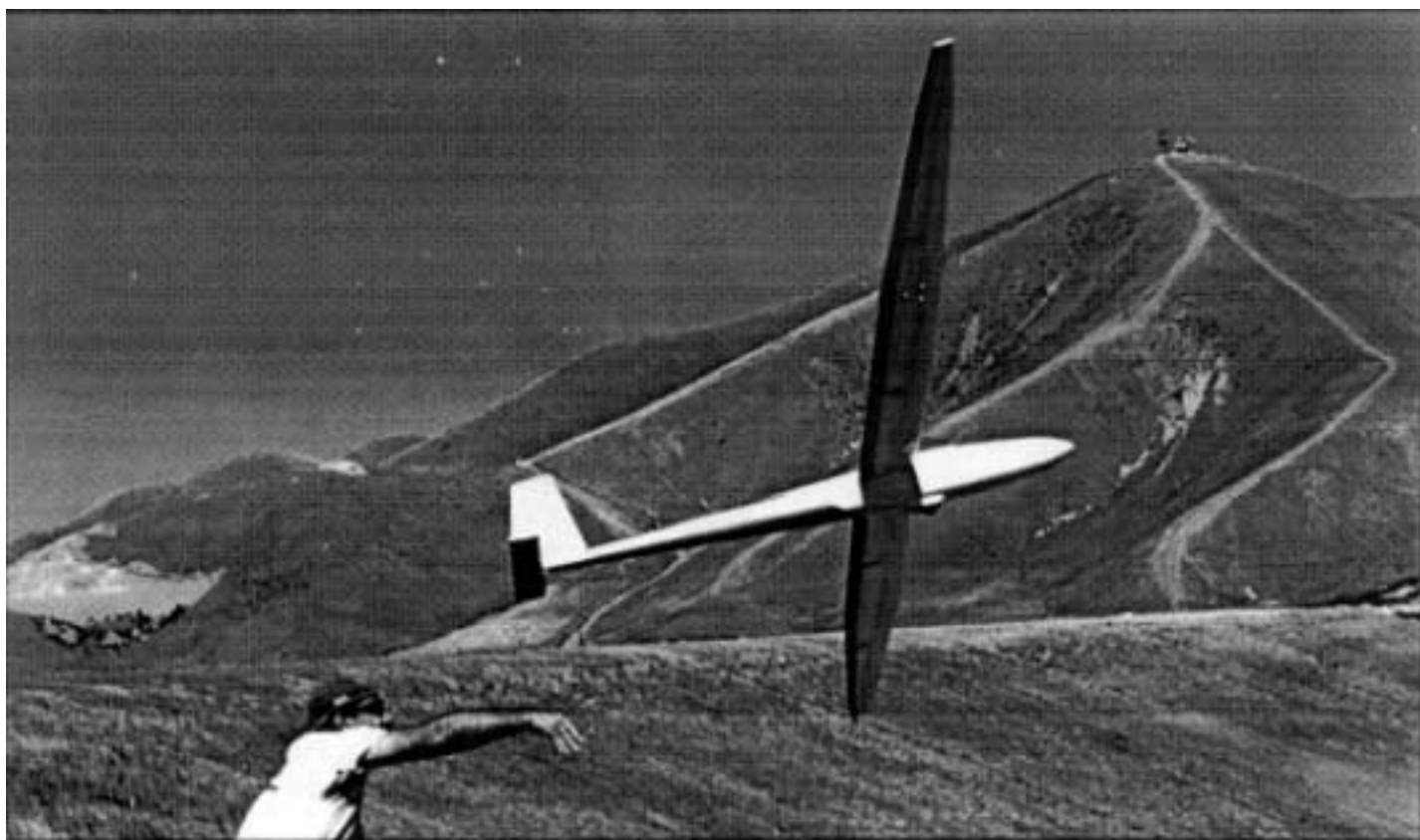
The **Micro-Maxx** servo became THE servo  
to match the new high performance  
airframes of today.

Still we envisioned a new generation of  
servos, that offer even more:

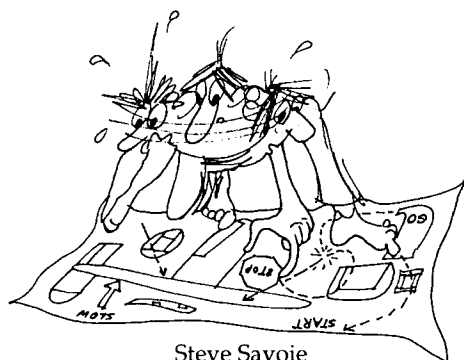
**More power, stronger gears, more**  
internal case support for the gears and gear-  
shafts, **thicker** gears, temperature stable  
neutral even under 'X'treme conditions  
leaving speed, size, mounts and low current  
consumption all the same!

We envisioned the

## New X - Series



## "SHORT CUTS"



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

### SOAR UTAH

I just got back from SOAR UTAH 2000. It was an excellent event, very well managed, and included three GREAT flying locations: Point of the Mountain, Francis Peak (+5000' above the valley), and Antelope Island located on the Great Salt Lake.

The Antelope Island flying was off to a great start with many war birds flying in formation; some folks preferred to Dynamic Slope a small backside ridge, and still another tossed a 4 meter EPP scale ship off the slope into the lightest of lift.

Of course, who's name comes to mind when you think of EPP? Well, for me, it is Dave Sanders, who arrived with family and planes in tow after an all night drive from Capistrano Beach, California. For myself, I had one of his DAW P-51 Mustangs and a recently constructed 1-26 two

meter. While both enjoyed hours of flight time at Utah, *neither* compared to what I saw Dave assemble behind his truck.

### Whigam GW-7

As most of you know, Dave likes *unique* aircraft and goes to no end to find the real thing in order to build a scale model of the original. One of these days, he's going to design and build a wild-looking full size just so he can scale it! Right, Dave?

Anyway, the plane he was assembling was a Whigam GW-7. Try to find that in the documentation books! Dave did (find one, that is), having zeroed in on the **only one** ever built, in Escondido, California. This 15 meter, experimental craft is definitely a one and only. Dave obtained a 3-view, took pictures of the plane for documentation, and uncovered a little information from the SSA archives.

One can only describe this thing as a torpedo fuselage with a bubble canopy and pencil thin wings. The plane is a true EPP aircraft, like nothing you've ever seen before!

The fuselage was made out of two slabs of 1.3# EPP on either side of a full length 1/4" balsa vertical stringer, spiral wrapped with filament tape. The fuselage also supports a 1/2" 6061-T6 aluminum joiner with plywood root supports cleverly bonded to the fuse/stringer. Building the wing (which has the most graceful bends) was done using three different sizes of vertical spars which all have overlapping vertical joints. (Try and do *that* without stress sizers.) Absolutely everyone at Soar Utah who saw the long (24:1 aspect ratio) wing flex in the turns was

taken by the graceful arch and ever so light bounce.

Dave used a MH32 airfoil which is 12% at the root and 8.7% at the tips, with a small amount of washout. The wings have so much flex, Dave had to segment the ailerons into 3 sections to deal with hinge lock. Each wing has three EPP panel sections — the first 2 are constructed of 1.9# EPP, while the remaining tips are 1.3# EPP. The flaps are conventional; all control surfaces have tape hinges. The wings utilize conventional EPP taping methods. Other controls include rudder, aerotow release, elevator, ailerons, and flaps.

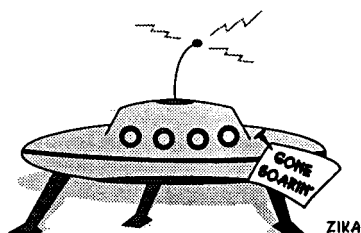
With only about 10 flights on the plane, Dave says you definitely have to fly this one with the rudder. The wing has 812 sq. in., total weight is 90 oz., and stab area is 50 sq. in. Dave said the stab (and it's small) was increased 15% over scale, in order to settle the plane down.

The plane is a work of art and, from only a few feet away, can easily pass for glass and wood over foam. Knowing Dave, we all had to assume it was EPP, though there were a few who still didn't believe it until Dave gave it a little squeeze. The plane is a real curiosity stopper and it flew very nice at both sites.

I'll always remember Dave's first flight into the declining slope lift at Antelope Island. He was really scratching for altitude when someone in the background said, "He's going to have to land out!" To which, Dave replied, "The H@\*# I am!" Gently working a little bubble of up, Dave was soon back at height, well above our heads. Isn't inspiration grand? ■



Dave Sanders' Whigam GW-7.  
Photography by Joe Chovan.



#### Closet Scale Stuff At Sailplanes Unlimited, Ltd.

1/3 Pribek ASW 27 - 5 meter span (196"),  
wing profile HQ 2.5/12, ca. 20 lbs.  
1/4.2 FiberClassics Nimbus 4 - 6.28 meter  
span (246"), wing profile E 68-66, ca. 18 lbs.  
1/3.6 Roedelmodell DG 800 - 4.15 meter span  
(163"), wing profile E 207, ca. 11 lbs.  
1/3.75 Roedelmodell Fox MDM-1 - 3.8 meter  
span (149"), wing profile RG 12, ca. 15 lbs.  
1/2.77 PriBek ASW 19 - 5.4 meter span (212"),  
wing profile Ritz 3 mod., ca. 20 lbs.  
Please call for additional info: (212) 879-1634.

## New X - Series

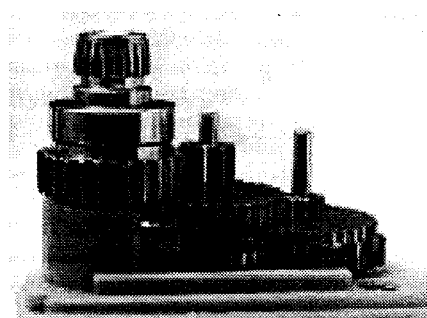
*X - Series equals ALL those requests!*

The new redesigned steel/brass/bronze gear set of our new **X-Series** servos has a 20% higher efficiency; thus we managed to increase the torque by 20% at same low current demand.

The new **Micro-Maxx-X** Servo provides impressive 55 oz. in at 4.8 Volts - no need for RX warranty voiding 5 cell packs!

Output gears are thicker using rigid hardened steel shafts to handle the increased power!

Don't be fooled by the same plain look outside! Yes, the size and shape and lug mounts of our **X-Series** servos are still the same **BUT** inside almost everything has been changed:



The gear 'deck' has stiffening 'beams' molded in, the output gear is supported between the ball bearing on top and a solid 1/5 inch high 'counter-bearing' below ( see photo ).

AND the new **X-** amplifier component virtually zeroes high temperature effects.

**X** equals More Torque, Thicker Output Gear & Stronger Shaft, More Internal Gear/ Case Support, Temperature Stable Amplifier.

**Micro-Maxx-X:** 1.1 x 1.4 x 0.5"; 0.67 oz;  
55 oz.in torque at 0.18 sec/ 60° at 4.8 Volts

Our **Micro-Star-X** and **Wing-Maxx** Servos will use the same **X-** amplifier component.

Mark your **X** on your order form for the new **Micro-Maxx-X** at following **VOLZ** dealers:

**Chicagosky** > [www.chicagosky1.com](http://www.chicagosky1.com)  
**N S P** > [www.nesail.com](http://www.nesail.com)  
**RC-Direct** > [www.rc-direct.com](http://www.rc-direct.com)  
**RC-Country** > [www.rccountryhobby.com](http://www.rccountryhobby.com)  
**Shredair** > [www.shredair.com](http://www.shredair.com)

Find more detailed informations on our website. Visit us and win cool **VOLZ** servos:

[www.volz-servos.com](http://www.volz-servos.com)



# COMING IN 2001

## *Sailplanes, Volume 1, 1920-45 by Martin Simons*

This is an entirely new comprehensive work by sailplane historian, pilot and model flyer Martin Simons. In the first volume 100 early sailplane types from many countries are described in the text and illustrated with more than 300 authentic photographs, some in full color. New, accurate and detailed three-view scale plans of each type, with color shading, have been drawn digitally by the author. These are based on the most exact information available and have not been previously published in this form. Hardback, size is 11" x 9" and 256 pages.

ISBN 3 9806773 4 6

Price US\$48.95

## STILL AVAILABLE

## *ALI MISTERIOSE Teichfuss e Pavullo: oggi si vola a vela by Rino Rinaldi*

Luigi Teichfuss, Italy's forgotten glider designer and his designs are remembered in this first quality book. Written in Italian, it contains numerous b&w photographs and line drawings for each design. This information can be found nowhere else. Hardback, size is 12" x 8½" and 177 pages.

Price US\$54.95

## ORDER FORM

Please send me the following items:

\_\_\_\_\_ *World's Vintage Sailplanes*, \$64.95 ea.\_\_\_\_\_ *Slingsby Sailplanes*, \$64.95 ea.\_\_\_\_\_ *German Air Attaché*, \$32.95 ea.\_\_\_\_\_ *Sailplanes by Schweizer*, \$64.95 ea.\_\_\_\_\_ *Ali Misteriose (Teichfuss)*, \$54.95 ea.\_\_\_\_\_ *Gliding History Calendar*, \$27.95 ea.\_\_\_\_\_ *Gen. Aviation History Calendar*, \$27.95 ea.\_\_\_\_\_ *Airliners Calendar*, \$27.95 ea.\_\_\_\_\_ *Story of Aviation Notecards*, \$9.95 ea. box

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Raul Blacksten

P. O. Box 307

Maywood, CA 90270 USA

Inquiries: &lt;raulb@earthlink.net&gt;

## 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.



### Specifications:

Wing Span: 82" (2 m)  
Wing Area: 269 sq. in.  
Weight: 20 oz.  
Wing Loading: 10.7 oz./sq. ft.  
Airfoil: S3010  
Radio: Standard radio/  
Sub-Micro servos  
Price: \$299.00 + 15.00 S+H

### ASW-27 & ASW-28 (2m)

#### All Glass RTF Kits

...from ICARE Sailplanes

Latest addition to the finely crafted scale gliders by ICARE Sailplanes, are the ASW-27 and ASW-28, all glass 2m gliders.

The ASW-27 is now well known, while the new ASW-28 is currently in production; improvements are triple taper leading edge and high aspect ratio winglets.

These models are very scale accurate, best suited for slope flying, but will do well on a good thermal day. Due to their high aspect ratio, the ASW-28 and ASW-27 will cover a lot of ground, but due to its low wing loading, it has very smooth handling characteristics. They are easy to put together, yet require some skill and are destined for the intermediate pilot.

The kit comes completely finished. The wings are hollow core molded and the ailerons are cut out. The winglets are molded onto the wing. The clear plastic canopy is fitted to the fiberglass tray; wing joiner system is installed in the fuselage.

All that's required is your radio gear. You will need 4 sub-micro servos and a small 4 channel receiver.

ICARE Sailplanes  
381 Joseph-Huet, Boucherville  
Québec, Canada J4B 2C5  
Tel: (450) 449-9094  
Fax: (450) 449-3497  
E-mail: ICARE@telts.com

<http://www2.jonction.net/~icare/icare.htm>



### P. S. Flyer 99"

...from Buzz Waltz R/C Designs

The P.S. Flyer 99", an ideal trainer, is a cabin type, electric powered sailplane.

Because of the large wing area, 1045 square inches, with the motor off, it will thermal, thus giving a student pilot a lot of flying time.

The wing is of 2 piece construction with spruce spars and I-beam sheer webbing to the tip. The wing is joined together with a 1/4" steel rod fitted into a brass tube.

The P.S. Flyer 99" has been designed for the Graupner Speed 700 Electric Motor with the 2 to 1 belt drive and 12/8 Master Electric Wood Propeller.

Construction is simplified with the use of

full size plans and step-by-step instructions on this all balsa and lite-ply kit.

The kit is available in a Standard kit, Deluxe kit (with the motor, belt drive and propeller), or Super Deluxe kit (with motor, belt drive, prop, and 55 amp micro speed controller with BEC).

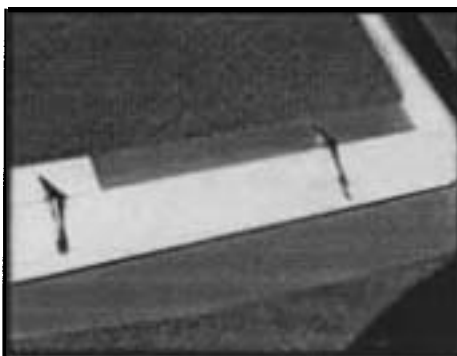
Kit price: Standard (\$100), Deluxe (\$220), Super Deluxe (\$309) plus S&H.

Available directly from:

Buzz Waltz R/C Designs  
68-320 Concepcion Rd.  
Cathedral City, CA 92234  
(760) 327-1775

Fax: (760) 778-5439

[buzzwaltzrc@excelonline.com](mailto:buzzwaltzrc@excelonline.com)



Go from this...

### Fenders

...from Viking Models, U.S.A.

Want to cover your aileron and flap pushrods with a set of fenders, which will help protect the bottom of the wings and control horns?

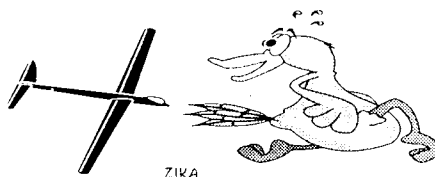
Fenders are constructed of High Impact Styrene Plastic, .020 inches thick. Can be easily cut to size using a pair of scissors. Tape or glue in place. Fender is 4 3/4" long, long enough to fit most wings.



...to this!

Price: \$5.95 in the U.S.A., plus \$3.50 S&H. Texas residents add 7.250% sales tax, please.

Viking Models, U.S.A.  
2 Broadmoor Way  
Wylie, TX 75098  
(972) 442-3910  
[RCSDigest@aol.com](mailto:RCSDigest@aol.com)



ZIKA



## NEW PRODUCTS



Wing span: 40"  
Airfoil: Clark Y - Flat Bottom  
Length: 27.5"  
Weight: 12.3 oz.  
Price: \$169.95  
Controls: Rudder, Elevator, ESC (motor)

Powered by a geared electric 280 motor (included)

JES 05 electronic speed control (suggested)

7 cells 350 mAh Ni-CAD or 650mAh Ni-M-H battery pack (suggested)

### "Elfi" Garden Flyer RTF

...from Hobby Club

The Elfi Garden Flyer has a beautiful handcrafted, built-up wing; solid balsa rudder and stabilizer are covered. Fuselage is made out of white gelcoated fiberglass (pod) and a fiberglass tube (tail-boom). A complete set of trike fixed landing gear/wheels and 3 bladed prop/spinner are supplied.

Available from selected retail outlets as well as direct from:

Hobby Club  
P.O. Box 6004  
San Clemente, CA 92674  
(949) 240-4626  
fax: (949) 240-5931  
<http://www.hobbyclub.com>



### Also from Hobby Club



Glider Accessory  
PumN-020 **Hand Winch** (5.75:1)  
Price: \$59.95

### Also from Hobby Club

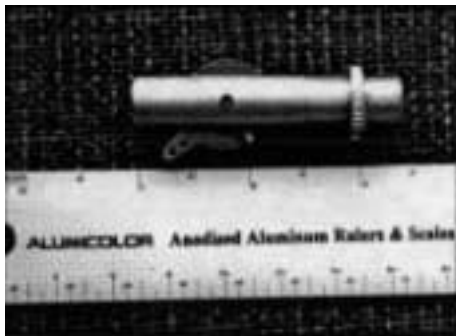


**Amethyst F3J**, 3.41m w/s, MH32 airfoil, 1500 grs (52.6 oz.) weight. Price: \$799.95.



### Fluffie HLG, ARF

Wing span: 60"  
Wing Area: 450 sq. in.  
Airfoil: S-4083  
Length: 34.8"  
Empty Weight: 6.5 oz.  
Wing Loading: ~ 4 - 4.5 oz./sq. ft.  
Introductory Price: \$149.95  
(Electro fuselage available for "400" series motor.)



Glider Accessory  
PumN-015 **Aluminum Tow Release**  
Price: \$24.95

### Tow Hooks

...from Ziegelmeyer Enterprises

Ziegelmeyer Enterprises is again producing heat treated aircraft alloy steel tow hooks in 1/8" dia. 'standard' and 3/16" dia. 'F3B' sizes. All tow hooks come complete with hardware. They also have an inexpensive 1/8" hook for light use.

Soon to be offered: adjustable tow hooks, bellcranks, control horns and rubber landing skids.



### "Electric Airshow" Video

...from Radio Carbon Art

The electric revolution is coming! Enjoy the latest electric powered aircraft flown by top pilots in the new video "Electric Airshow". This 56 minute, digitally produced video features ducted fan jets, park flyers, electric pylon racing, F5B hotrods, E-Copter, electric combat, scale, old timers, conversions, and e-sailplanes. "Electric Airshow" was shot on location at the San Diego Electric Midwinters, which is one of the largest all e-power meets in North America. If you currently enjoy electron powered planes or would like to see how the latest designs perform, this professionally produced video is for you. See smooth flying, hear cool music, and enjoy the sites and sounds of planes whizzing quietly by. The website at [www.radiocarbonart.com](http://www.radiocarbonart.com) provides preview images, allows you to read reviews, and to find out more about other Radio Carbon Art excellent silent flight videos. All major credit cards and checks accepted. Money back guarantee. "Electric Airshow" video @ \$19.95 + \$3.50 Priority Mail. Credit cards accepted.

Radio Carbon Art  
P.O. Box 2311  
Corvallis, OR 97339-2311  
(541) 752-9661  
Web site: [www.radiocarbonart.com](http://www.radiocarbonart.com)



### Current prices:

- 1/8" dia. 'standard' tow hook \$3.50
- 3/16" dia. 'F3B' tow hook \$4.25
- 1/8" dia. 'CHEEPIE' tow hook \$1.75 or 5 for \$7.00

ZIEGELMEYER ENTERPRISES  
1510 W. 134th St.  
Gardena, CA 90249  
(310) 715-2887  
<http://home.earthlink.net/~ziegelmeyer>

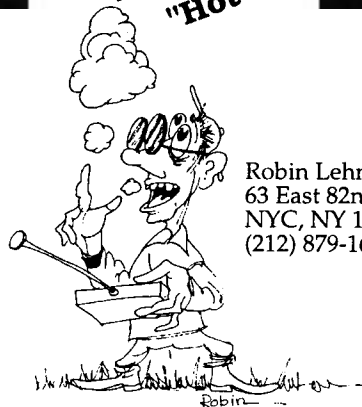




Brian Chan's ASK 13 at Los Banos. Photo by Don Sklar.



"Hot Air"



Robin Lehman  
63 East 82nd St.  
NYC, NY 10028  
(212) 879-1634



Full size Blanik L 33 ready for tow at the Dansville, New York airport.



Full size Schweizer 1-35 ready for take-off.



The only Slingsby Skylark flying in the world! Wouldn't it make a beautiful scale model?

## NEW PRODUCTS

### Density EPP Foam !

#### EPP Foam

...from Mark Gervais and RPV Industries

Mark Gervais and RPV Industries are cooperating to bring the new, light 0.9 pound per cubic foot density EPP foam to the market. Mark originally discovered the material, and RPV is helping to market it through its existing customer base, web presence, and print advertising.

This foam is 30% lighter than 1.3 density,

with the same bouncibility. Bead to bead adhesion is excellent, and it cuts with a hotwire just like the 1.3 and 1.9 densities of EPP. This is a great new material for HLG or any application where light weight is an advantage.

EPP in 0.9 density is available in 2" thick sheets, 24" x 36" for \$17.50 plus shipping (\$6 for 1-2 ea., \$9 for 3-6 ea.). Other sizes (and densities) are available, including 4" thick.

Rick Powers  
RPV Industries  
3428 Middlefield Rd.  
Palo Alto, CA 94306 USA  
<http://members.aol.com/rpvi/EPP.html>  
rpvi@aol.com

Mark Gervais  
1385 St. Robert, St. Lazare  
Quebec, Canada J7T 2K5  
(450) 424-6569  
[mark.gervais@sympatico.ca](mailto:mark.gervais@sympatico.ca)

**CENTRAL ARIZONA SOARING LEAGUE  
PROUDLY PRESENTS THE  
THIRTEENTH ANNUAL SOUTHWEST CLASSIC  
FEBRUARY 3<sup>rd</sup> & 4<sup>th</sup>, 2001  
FIRST OF THE 2001 TRIAD SERIES**

**TASK:** ✈ Saturday, Feb. 3rd, 2001  
Four Rounds of Add-Em-Up

✈ Sunday Feb. 4th, 2001  
Three Rounds of Add-Em-Up

**LANDINGS:** To Be Announced at the Pilots Meeting

**CLASS:** Unlimited - 444(D)

**SITE:** Schnepf Farms – Queen Creek, AZ

**A.M.A.:** 2001 AMA cards will be required at registration. One pilot per plane. One plane per pilot with a backup on same frequency allowed if primary plane determined unflyable by the C.D. All 2001 AMA rules apply.

**ENTRY FEE:** \$35 (non-refundable) **ENTRIES LIMITED TO THE FIRST 200 APPLICATIONS RECEIVED.**  
**Registration closes Jan. 1, 2001.**

**AWARDS:** ADD-EM-UP 1<sup>st</sup>-10<sup>th</sup>, will be awarded, 1<sup>st</sup>-3<sup>rd</sup> place RES and 1st place Team Trophies for the top four members of a previously declared team, 1<sup>st</sup>-3<sup>rd</sup> 2Meter and Gray Cup (62+ yrs) and Junior Cup (16 yrs or less). You may enter more than one event but you will use the same ship for all of them.

**BBQ:** Saturday evening at the field, steak & chicken, drinks, good spread - \$15 ea.

**T-SHIRTS:** CASL will be taking pre-orders for SWC '01t-shirts, cost \$15 for T-shirt, \$20 for Golf style shirt w/pocket. Sizes in adult are L, XL, XXL, XXXL. There will be a very limited selection at field.

**RAFFLE:** Great Hobby Items!! Sunday, immediately after the contest.

**C.D.:** Dave Wenzlick: 480-345-9232. For info contact Erich Van Sanford at [www.erich@asu.edu](mailto:www.erich@asu.edu)

Make all checks payable to: **Central Arizona Soaring League.**

Mail to: **CASL 3519 W Oakland Chandler, AZ 85226**

SOUTHWEST CLASSIC, FEBRUARY 3 <sup>rd</sup> & 4 <sup>th</sup> , 2001									
Name:					Phone: (      )				
Address:					City:				
State:		Zip:		AMA #		Frequency: #1		#2      #3	
Team Name:				Email Address:					
						SWC '01 Shirts: (write quantity in appropriate box)			
RES CLASS:	YES	NO	(circle one)	Gray Cup	YES	NO	Size	Golf Shirt (\$20)	T-shirt (\$15)
2 Meter Class:	YES	NO	(circle one)	Junior Cup	YES	NO	Large		
Entry Fee:		\$ 35.00				X-Large			
BBQ: x \$15.00		\$				XX-Large			
Shirt Order (fill in form)		\$				XXX-Large			
TOTAL ENCLOSED		\$							

## SCHEDULE OF SPECIAL EVENTS

October 21

SAGE Fall Contest Tucson, AZ  
Philip Brister, (520) 394-2121  
philipbrister@netscape.net

October 21

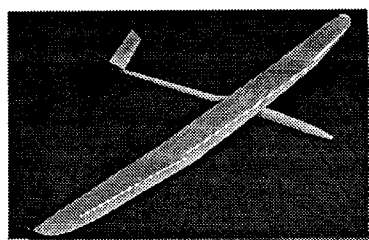
Southern California Apple Valley, CA  
Scale Glider Festival 2000  
Rick Briggs, (562) 865-2464  
http://www.sailingis.com

February 3-4, 2001

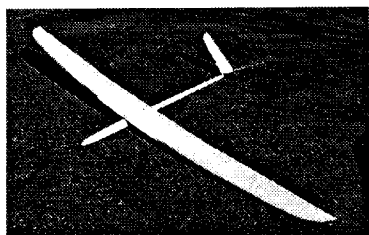
Southwest Classic Queen Creek, AZ  
Dave Wenzlick, (480) 345-9232  
www.public.asu.edu/~vansanfo/casl

For detailed information on events  
outside of the U.S.A., please view  
www.sailplanes.com event schedule.

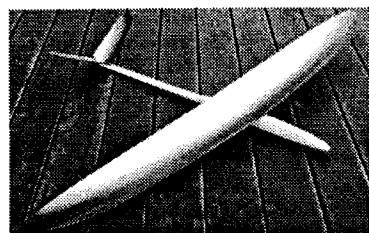
Please send in your scheduled  
events as they become available!



Hera - Artemis F3J from: \$659.00  
All molded, 3.1m, SD7035, 1.8-2kg  
Hades F3F from: \$599.00  
All molded, 2.8m, RG15, 1.8-2kg



El Camino F3B - F3J from: \$669.00  
All molded, 3.2m, MH-32, 2-2.2kg



Nemesis slope racer from: \$299.00  
All molded, 1.5m, HN-1038, 0.7kg

www.jonction.net/~icare/icare.htm



e-mail: ICARE@telts.com  
ph.: (450)449-9094  
fax: (450)449-3497  
381 Joseph-Huet, Boucherville, QC  
J4B 2C5, Canada

## Classified Advertising Policy

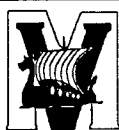
Classified ads are free of charge to subscribers provided the ad is personal in nature and does not refer to a business enterprise. Classified ads that refer to a business enterprise are charged \$5.00 per month and are limited to a maximum of 40 words. The deadline for receiving advertising material is the 15th day of the month. (Example: If you wish to place an ad in the March issue, it must be received by February 15.) RCSD has neither the facilities or the staff to investigate advertising claims. However, please notify RCSD if any misrepresentation occurs. Market Place Listings are \$5 a month. 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

**PC-Soar Version 3.7** Sailplane Performance Evaluation Program with Airfoil and Sailplane Library expanded to 60 models including Chrysalis, Anthem, Genesis, Peregrine, Probe, Thermal Eagle, and Spectrum. Airfoil library includes 322 polars with 56 UIUC polars. PC-Soar with Libraries of Sailplanes and Airfoil Polars plus a new Excel utility for working with multi taper wing areas and aerodynamic centers. Reduced Cost: \$50 + \$3 P&H. PC-Soar library and software Upgrade to Ver. 3.7: \$10 + \$3 P&H. LJM Associates, 1300 Bay Ridge Rd., Appleton, WI 54915; ph: (920) 731-4848 after 5:30 p.m. weekdays or on weekends. E-mail: [lmurray@athenet.net](mailto:lmurray@athenet.net). PC-Soar Web Page: <http://www.athenet.net/~atkron95/pcsoar.htm>.

**PARACHUTES: \$10.** Dale King, 1111 Highridge Drive, Wylie, TX 75098; (972) 475-8093.

**DesignAire: EASY TO USE AIRCRAFT DESIGN SOFTWARE (PC).** 3-D sketch, performance, Wt/Bal, inertias, color graphs, panel analysis, static stability, airfoils, envelope, FAR 23A loads and envelope. Runs "airfoil ii". \$119. JammAero POBox 236, Hornstown VA 23395. [www.jammaero.com](http://www.jammaero.com).

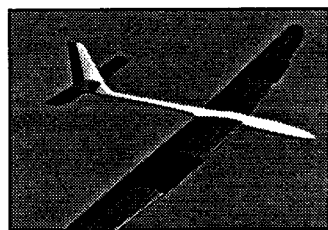


## CUSTOM DESIGNED, FIBERGLASS FUSELAGES FOR THE SCRATCH BUILDER

VIKING  
MODELS,  
U.S.A.

Serving Scratch Builders  
Since 1979

2 Broadmoor Way  
Wylie, TX 75098-7803 U.S.A.  
(972) 442-3910  
[RCSDigest@aol.com](mailto:RCSDigest@aol.com)  
9:00 A.M. - 5:00 P.M. CST



## STILETTO RG-15

### Design Suggestions

Fuselage designed to take a heat shrink battery pack in the nose, with a standard size receiver, on/off switch, and 3 standard size servos in tandem. Fuselage designed by Bernard Henwood. Recommended for thermal or slope, intermediate to expert.

S&H via U.P.S. - Continental U.S.A.  
(Texas residents add 7.25% state sales tax.)

Check or money order only, U.S. funds, please. C.O.D. \$10.00 additional. Prices subject to change without notice.

### Dear Scratch Builder,

Many of you have asked for fuselages that we have not been in a position to provide, as most of you know, until now. But, we're back, at least for a limited time.

The thermal/slope, epoxy fiberglass fuselages shown below, are the first of our Viking line, and include suggested specifications (wing span/airfoil/radio channels). We **will not** carry an inventory, but rather custom make each fuselage as the orders are received. We want to do things right, so delivery time varies, and can take up to a month or longer, depending on what you want.

Jer

## Thermal or Slope

Epoxy Fiberglass Fuselages	Price	S&H
Aeolus III (60"/NACA 63A010/3)		
43" fuse, plans	\$75.00	\$15.00
Condor 3m (bolt-on wing mount/up to 10" chord)		
52 1/4" fuse, nose cone	\$90.00	\$15.00
Contestant (148"/E205/3-4/10.5" chord)		
60" fuse, canopy, tray	\$90.00	\$15.00
Elf 2m (bolt-on wing mount/up to 10" chord)		
44 3/8" fuse, nose cone	\$80.00	\$15.00
Oden (100-130"/S3021/As Req./10.25" chord)		
51" fuse, canopy	\$85.00	\$15.00
Raven 3m (119"/Mod. E193/As Req./10.75" chord)		
51" fuse, plans	\$90.00	\$15.00
Stiletto II (100-136"/Any/As Req./10" max. chord/bolt-on wing)		
49" fuse	\$85.00	\$15.00
Stiletto RG-15 (100-136"/RG-15/As Req./plug-in wing)		
49" fuse	\$85.00	\$15.00
Stiletto S-3021 (100-136"/S-3021/As Req./9.5" Chord/plug-in wing)		
49" fuse	\$85.00	\$15.00
Stiletto S-7037 (100-136"/S-7037/As Req./9.5" Chord/plug-in wing)		
49" fuse	\$85.00	\$15.00
Stiletto HQ 25/9 (100-114"/HQ25/9/As Req./10" root cord/plug-in wing)		
49" fuse	\$85.00	\$15.00
Zen (100"+/None/Var.)		
51" fuse, hatch	\$85.00	\$15.00

All fuselages are Kevlar™ reinforced.

**SAILPLANE PLANS:** Copies of ORIGINAL, SOAR BIRDY & BIG BIRDY plans as originally kitted by Bridi Hobbv. \$12.00 per set, shipping included. BUZZ WALTZ, 68-320 Concepcion Rd., Cathedral City, CA 92234, 760-327-1775 or e-mail, [buzzwaltzrc@excelonline.com](mailto:buzzwaltzrc@excelonline.com).

## For Sale - Personal

1/4 Roedel Super Cub (towplane), 2.687 meter span, wing profile Clark Y mod. (suitable motors are 160 T, 300 T, OS BGX-1, Brison 3.2 or similar), NIB... \$385.00. Contact Robin Lehman, 63 E. 82nd St., New York, NY 10028; (212) 879-1634.

Oden, like new, flown about 10 hours, 135" span, very gentle to fly, has air brakes... \$650 w/all servos. Eclipse V, all molded, very nice, good thermal ship... \$500 or \$735 w/all servos. Add S&H. Dale King, (972) 475-8093, Wylie, Texas.

Multiplex Helios Vario - Thermal Sniffer. NIB, never used. \$250 or best offer plus \$10 shipping in U.S.A. Call Frank, (818) 790-1297, California.

## Hobby Shops that Carry RCSD

Gunnings Hobbies 538 San Anselmo Ave. San Anselmo, CA 94960 (415) 454-3087	Hobby Town U.S.A. 8060 S. 84th St. La Vista, NE 68128 (402) 597-1888
Gyro Hobbies 23052 Lake Forrest Dr. Unit C2 Laguna Hills, CA (714) 583-1775	Hobby Warehouse 4105 South Street Lakewood, CA 90712 (562) 531-8383
Hobbies "N Stuff 9577-L Osuna Rd. NE Albuquerque, NM 87111 (505) 293-1217	King R/C Five Forks Village King, NC 27021 Tim's Bike & Hobby 2507 Broadway Everett, WA 98201 (206) 259-0912

## 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 (NASF), Ron Swinehart, (256) 722-4311, <ron.swinehart@lmco.com>, or Rob Glover at AMA365@aol.com, <http://shl.ro.com/~samfara/>

Alabama - Central Alabama Soaring Society, Ron Richardson (Tres.), 141 Broadmoor Ln., Alabaster, AL 35007, <ron\_mail@bellsouth.net>.

Alabama - Southern Alabama & NW Florida Aerotow, Asher Carmichael, (334) 626-9141, or Rusty Rood, (904) 432-3743.

Arizona - Aerotowing, slopesites in AZ (rugged), Arizona Flying Eagles R/C Demo. Show Team, Dave Wenzlick, (480) 345-9232, <azdw@uswest.net>, or visit CASL at <<http://www.public.asu.edu/~vansano/casl>>.

Arizona - Southern Arizona Glider & Electric (Tucson area), Philip Brister (contact), philipbrister@netscape.net, (520) 394-2121. SAGE welcomes all level of flyers!

Arkansas - Northwest Arkansas Soaring Society, Tom Tapp (President), RT 2 Box 306, Huntsville, AR 72740; (501) 665-2201, eve.

California - DUST, Buzz Waltz, 68-320 Concepcion, Cathedral City, CA 92234, (760) 327-1775, <buzzwaltzrc@excelfonline.com>.

California - High Desert Dust Devils, Stan Sadorf, 14483 Camrose Ct., Victorville, CA 92392; (760) 245-6630, <Soareyes@aol.com>.

California - Inland Soaring Society, Robert Cavazos, 12901 Forman Ave., Moreno Valley, CA 92553, RCAV@aol.com.

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

California - Sacramento Valley Soaring Society, Dudley Dufort, 225 30th St., Suite 301, Sacramento, CA 95816, (916) 448-1266, <www.svss.org>.

California - Soaring Union of Los Angeles, John Bruce, 908 W 245th St., Harbor City, CA 90710, (310) 534-0948, <rcflyinman@aol.com>.

California - South Bay Soaring Society, Mike Gervais, P.O. Box 2012, Sunnyvale, CA 94087; (408) 683-4140 (H), (650) 354-5469 (W).

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.

Colorado - Rocky Mountain Soaring Assn., Phil Weigle, 1290 Salem St., Aurora, CO 80011; (303) 341-9256 eve.

Eastern Soaring League (VA, MD, DE, PA, NJ, NY, CT, RI, MA), Tom Keisling (Pres./Editor), (814) 255-7418, kiesling@ctc.com; Ben Lawless (Sec./Tres.), LawlessB@ang.af.mil; Anker Berg-Sonne (Scorekeeper), (508) 897-1750, anker@ultranet.com; Josh Glaab (Contest Coordinator), (757) 850-3971, jlglaab@pinn.net; <<http://www.eclipse.net/~mikel/esl.htm>>.

Florida - Florida Soaring Society, a league of Florida soaring clubs. Newsletters available on website <<http://www.asterix.specs.com/fss>>.

Florida (Central) - Orlando Buzzards Soaring Society ([www.specs-usa.com/~ingo/OrlandoBuzzards](http://www.specs-usa.com/~ingo/OrlandoBuzzards)), Jerre K. Ferguson (Pres.), 4511 Pageant Way, Orlando, FL 32808, (407) 295-0956, <jerre@bellsouth.net>.

Georgia - North Atlanta Soaring Association, Tim Foster, (770) 446-5938 or Tom Long, (770) 449-1968 (anytime).

Hawaii - Maui Island Slope Soaring Operation (MISO), Duane A.K. Asami, 262 Kamila St., Kula, HI 96790, pgr. (888) 932-6247, <dasami@mauigateway.com>.

Illinois (Chicago Area) - Silent Order of Aeromodeling by Radio, Jim McIntyre, 23546 W. Fern St., Plainfield, IL 60544-2324; (815) 436-2744. Bill Christian, 1604 N. Chestnut Ave., Arlington Heights, IL 60004; (847) 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.

Indiana (NE Indiana and NW Ohio) - League Of Flight by Thermal (LOFT), Ft. Wayne, Marc Gellart, (419) 229-3384, <isoar2@wcoil.com>, <[www.rc-aero.com/LOFT](http://www.rc-aero.com/LOFT)>.

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

Iowa - Eastern Iowa Soaring Society (IA, IL, IN, KS, NE, WI), Ed Harris (editor), 2000 NW 84th Ave., Ankeny, IA 50021; (515) 965-5942, <eharris.edwin@mcleodusa.net>, <<http://eiss.cnde.iastate.edu>>.

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

Kansas - Aerotowing, Jim Frickev, (913) 585-3714.

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

Kentucky - Louisville Area Soaring Society, Ed Wilson (Contact), 5308 Sprucewood Dr., Louisville, KY 40291; (502) 239-3150 (eve), e-mail <ewilson1@bellsouth.net>.

Louisiana - Capitol of Louisiana Soaring Society (CLASS), Leonard Guthrie (contact), 12464 Fair Hope Way, Baton Rouge, LA 70816, (225) 275-2122, flynguts@aol.com.

Maine - DownEast Soaring Club (New England area), <Jamesiii@blazenetme.net>.

Maryland - Baltimore Area Soaring Society, Erich Schlitkus (President), 52 North Main St., Stewartstown, PA 17363; (717) 993-3950.

Maryland & Northern Virginia - Capital Area Soaring Association (MD, DC, & Northern VA), Chris Bovais, 12504 Circle Drive, Rockville, MD 20850; (703) 643-5513.

Massachusetts - Charles River Radio Controllers, Dick Williamson (past president), 21 Pendleton Road, Sudbury, MA 01776; (781) 981-7857 (W), <williamson@ll.mit.edu>, <<http://www.charlesrivercc.org>>.

Michigan - Greater Detroit Soaring & Hiking Society, Greg Nilsen (Sec.), 260 Rosario Ln., White Lake, MI 48386-3464; (248) 698-9714, GNilsen624@aol.com.

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, (816) 833-1553, eve.

Missouri - Mississippi Valley Soaring Assoc. (St. Louis area), Peter George, 2127 Arsenal St., St. Louis, MO 63118; (314) 664-6613. Mark Nankivil, nankmc@quixnet.net, (314) 781-9175.

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

Nebraska - Lincoln Area Soaring Society (Wilson Slope Races), Jim Baker, 920 Eldon Dr., Lincoln, NE 68510, (402) 483-7596, jcbaker@inebraska.com, <<http://www.geocities.com/CapeCanaveral/Hangar/1671/lass-2.html>>.

Nebraska - SWIFT, Christopher Knowles (Contact), 12821 Jackson St., Omaha, NE 68154-2934, (402) 330-5335.

Nebraska - Ken Bergstrom, R.R. #1, Box 69 B, Merna, NE 68856; (308) 643-2524, <abergst@web-sandhills.net>.

Nevada - Las Vegas Soaring Club, Ray Dinoble, 10812 Hollow Creek Lane, Las Vegas, NV 89144, (702) 254-7911, <dinoble@juno.com>.

Nevada - Sierra Silent Soarers (Reno/Sparks/Carson City/Minden area), Chris Adams, (775) 345-1660, <<http://www.scrollsander.com>>, <<http://www.sierrasilentsoarers.htm>>.

New Jersey - Vintage Sailplane R/C Association, Richard G. Tanis (President/Founder), 391 Central Ave., Hawthorne, NJ 07506; (201) 427-4773.

New Mexico - Albuquerque Soaring Association (all soaring & electrics), Jim Simpson (contact), 604 San Juan de Rio, Rio Rancho, NM 87124; (505) 891-1336, <jimbonee@aol.com>, <<http://www.abqsoaring.com>>.

New York, aerotowing Rochester area, Jim Blum and Robin Lehman, (716) 335-6515.

New York - Elmira - Harris Hill L/D R/C, aerotowing & slope, John Derstine, (717) 596-2392, e-mail johnders@postoffice.ptd.net.

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

New York - (Buffalo/Niagara Falls area) - Clarence Sailplane Society: <http://www.bufflink.com/css/> or Lyn Perry, President, (716) 655-0775, perry@ecc.edu; Jim Roller, Competition Coordinator, 716-937-6427, Roli98@aol.com.

New York - Long Island Silent Flyers, Stillwell Nature Preserve, Syosset, NY, Ze'ev Alabaster (President), (718) 224-0585, or Peter DeStefano (VP), (516) 586-1731.

New York - Syracuse area, Central NY Sailplane Group, Dave Zintek, Minoa, NY, (315) 656-7103, e-mail Zintek@aol.com.

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

Northwest Soaring Society (Oregon, Washington, Idaho, Montana, Alaska, British Columbia, Alberta), Sandie Pugh (Editor - NWSS Eagle), 1119 SW 333rd St., Federal Way, WA 98023, e-mail: parrot2luv@aol.com, (253) 874-2429 (H), (206) 655-1167 (W).

Ohio - Cincinnati Soaring Society, Ed Franz, 7362 Ironwood Way, Burlington, KY 41005; (606) 586-0177, <ejfranz@fuse.net>.

Ohio - Dayton Area Thermal Soarers (D.A.R.T.S.), Walt Schmolli, 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, e-mail <tomnagel@iwaynet.net>.

Ohio, Kentucky & Indiana - Ohio Valley Soaring Series, Marc Gellart, (419) 229-3384, <isoar2@wcoil.com>, <[www.dma.org/DARTS/ovss/ovss.html](http://www.dma.org/DARTS/ovss/ovss.html)>.

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

Oklahoma - Tulsa R/C Soaring Club (TULSOAR), <<http://www.sitemaster.com/tulsoar>>.

Oregon - Bay Area R/C Fliers, Mike Shaw, <grizzly2@gte.net>, (541) 269-2423.

Oregon - Portland Area Soaring Society (PASS), Pat Chewing (Secretary), 16766 NW Yorktown Dr., Beaverton, OR 97006, (503) 645-0323, e-mail: patch@sequent.com, <[www.europanet.com/~patch/](http://www.europanet.com/~patch/)>.

Oregon - Salem Soaring Society, Al Szymanski, CD, (503) 585-0461, <<http://home.att.net/~aszys/sss/>>.

Oregon - Southern Oregon Soaring Society, Jerry Miller, 3431 S. Pacific Hwy. TRLR 64, Medford, OR 97501, e-mail Milljer@aol.com, ph/fax (541) 535-4410.

Tennessee - Memphis Area Soaring Society, Bob Sowder, 1610 Saddle Glen Cove, Cordova, TN 38018, (901) 751-7252, FAX (901) 758-1824.

Tennessee - Tullahoma (South Central), Coffee Airfoilers, Brian Smith, 317 Crestwood Dr., Tullahoma, TN 37388, (931) 393-4876, <bsmith@midtnn.net>.

Tennessee - Soaring Union of Nashville, Terry Silberman, PO Box 17946, Nashville, TN 37217-0946, (615) 399-0846.

Texas - aerotowing, Dallas area, Andrew Jamieson, 6931 Desco Dr., Dallas, TX 75225, (214) 369-6118, AJamieson@Sleepmed.com. Larry Sengbush, (972) 291-4840.

Utah - Intermountain Silent Flyers, Tom Hoopes, (801) 571-3702 (eve), "Come Fly With Us!"

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

Virginia - Blue Ridge Area Soaring Society (Central Virginia - Waynesboro), Tom Broeski, (540) 943-3356, <tjb@rica.net>.

Virginia - Tidewater Model Soaring Society, Herk Stokely, (757) 428-8064, herkstok@aol.com.

Virginia - Appalachian Soaring Association, Bristol VA & TN area, Daniel E. Didgeon, Apt A, 721 Meadowview Rd., Bristol, TN 37620; (423) 844-0518: voice mail (423) 914-4290, <ddijun2@aol.com>.

West Virginia & Pennsylvania - Tri-State Soaring, Chip Vignolini, 2784 Mill St., Aliquippa, PA 15001; (724) 857-0186, Voice mail (412) 560-8922, <ydney30a@prodigy.com>.

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

Wisconsin - Valley Aero Modelers, Lee Murray, 1300 Bay Ridge Rd., Appleton, WI 54915; (920) 731-4848, <lmurray@athenet.net>.

## T.W.I.T.T.

### (The Wing Is The Thing)

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines. Full information package including one back issue of newsletter is \$2.50 US (\$3.00 foreign). Subscription rates are \$20.00 (US) or \$25.00 (Foreign) per year for 12 issues.

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



### Outside U.S.A.

Australia - Southern Soaring League, Inc. Mike O'Reilly, Model Flight, 42 Maple Ave., Keswick SA 5035, Australia. Phones: ISD+(08) 8 293-3674, ISD+(08) 8 297-7349, ISD+(018) 8 082-156 (Mobile). FAX: ISD+(08) 8 371-0659.

Canada - Calgary R/C Soaring Society (Alberta), thermal duration & slope soaring, Chris Gregg (Pres.), (403) 226-1019, cgregg@cadvision.com; Eric Weder (Sec.), (403) 289-8844, eaweder@telusplanet.net.

Canada - Montreal Area - C2VM Glider Club, Jacques Blain (President), days (514) 443-5335, eve. (514) 652-6167.

Canada - Greater Niagara Area Thermal Soarers (GNATS), Flat Field Soaring & Aerotowing, Gerry Knight, (905) 934-7451 or Don Smith, (905) 934-3815.

Canada - MAAC Men Gliding Club, Jim Holland, 168 Verona Dr., Winnipeg, Manitoba, Canada R2P 2R8, (204) 697-1297.

Canada - Southern Ontario Glider Group, "Wings" Programme, dedicated instructors, Fred Freeman, (905) 627-9090, or Bill Woodward, (516) 653-4251.

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

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Japan - Dr. Paul "Sky Pilot" Clark, 2 - 35 Suikoen Cho, Hirakata Shi 573, Osaka Fu, Japan; IAC+(81) 720-41-2934, <pclark@osk3.web.ne.jp>

http://www3.osk3.web.ne.jp/~pclark/skypilot/

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

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### Reference Material

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

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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

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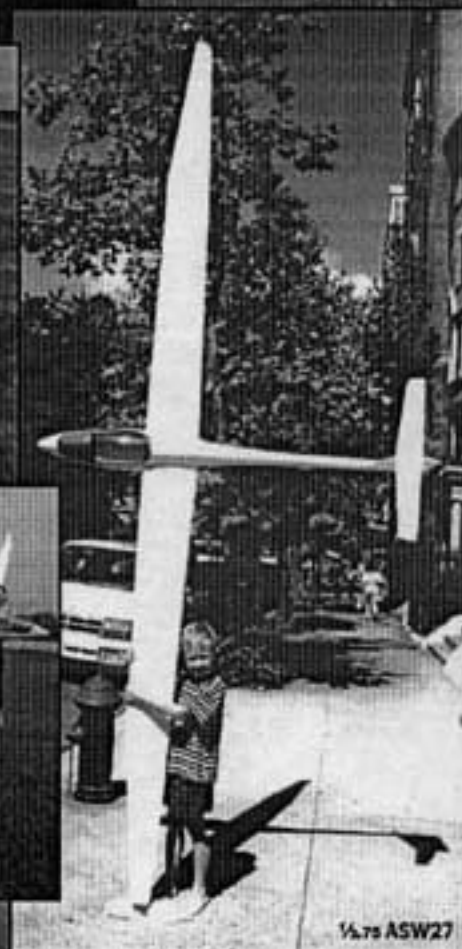
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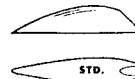
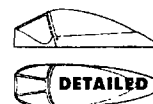
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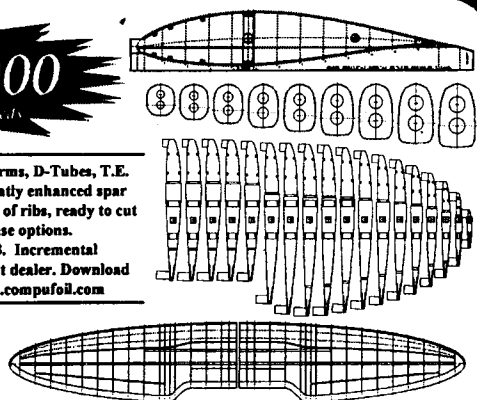
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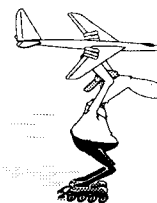
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