

November, 1997

Vol. 14, No. 11

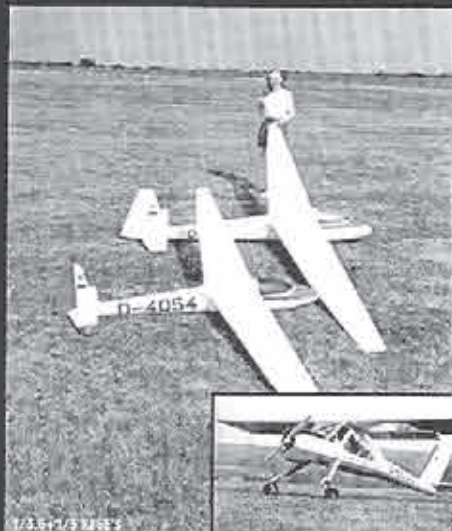
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Advertising rate cards will soon be available to accommodate the new size... Judy

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An Orlando Buzzards Thanksgiving
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The Soaring Site

What Happened to RCS D??

It changed!! Why? Because we simply did not want to increase subscription or advertising costs to keep pace with offset printing costs. Frankly, we really liked the smaller size; it's gonna take us awhile to get used to the new size. We hope you'll bear with us as we continue to evaluate, and try to refine, the new printing process. The content of RCS D is the same as always. While we do not expect any loss of quality for text or graphics, we will try to improve the quality of the photographs over the next few months.

Since we are now doing the printing in-house, we have a sizable investment in the new equipment required. But, hey, we really like doing what we're doing and as long as you want us to provide "a monthly look into the world of sailplane enthusiasts everywhere", we'll continue to do so. Oh, the quote, by the way, is courtesy of Joe Chovan, and we kinda like it! Thanks, Joe!

Yes, subscriptions are down, which is one of the things that allowed us to consider this change. But, that's OK!! We know many of you really like to share, and in this world of rising costs we certainly couldn't agree more. And, where material is readily at hand, we're free to consider adding more pages, here and there. Oh, and one note to advertisers. We no longer use film in the printing process.

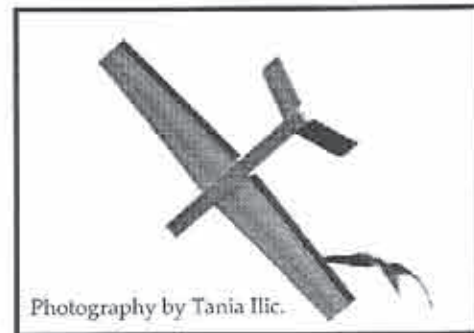
Artwork

We received a note from a subscriber who was having trouble reading the signature on the artwork included in the October issue, pages 20-21. He thought the work exceptionally good and wanted to let us know. The artist is Phil Bauer of Fremont, California; the artwork was submitted by Dan Davidson. Thanks, guys!

An Invitation

We received a message from Robert Yan of Hong Kong. He says, "I always wish to share the art of RC soaring with people, and I would appreciate it very much if you will inform the RCS D readers that after they are finished reading RCS D, they are welcome to drop by my web page at <<http://www.geocities.com/~hung/page2.htm>>."

Happy Flying!
Judy & Jerry Slates



Photography by Tania Ilic.



SOARING WITH GULLS, DOWNUNDER

Photography by Tania Ilic, one of Melbourne's top photographers, at Torquay Beach in Geelong, a coastal tourist surf beach on the southern coast of the state of Victoria, Australia.

Tania and Deruys, who own Dalmeyer Pictures, a photo/video production studio in Melbourne, are members of Wedding and Event Videographers Association (W.E.V.A.), Australian Institute of Professional Photography (A.I.P.P.), and Portrait Maker Institute of Professional Photography (P.M.I.P.P.).

Their achievements include: Gold Award Winners American International - WEVA Video Awards (1995 & 1996), *Bride to Be* magazine's Wedding Photographer of the Year (1996), 4 Silver Print Awards - A.I.P.P. National Print Awards (1996), 4 Silver Print Awards - A.I.P.P. State & National Print Awards (1997), and 2 Bronze Print Awards - A.I.P.P. National Print Awards.

Photography provided courtesy of Lex Liberato, Studio 'B' Design & Production, LLC., Hawaii.



This photo shows the high aspect ratio "thresher" vertical stabilizer and sleek fuselage shape.

Genesis in flight over Marion, Ohio.



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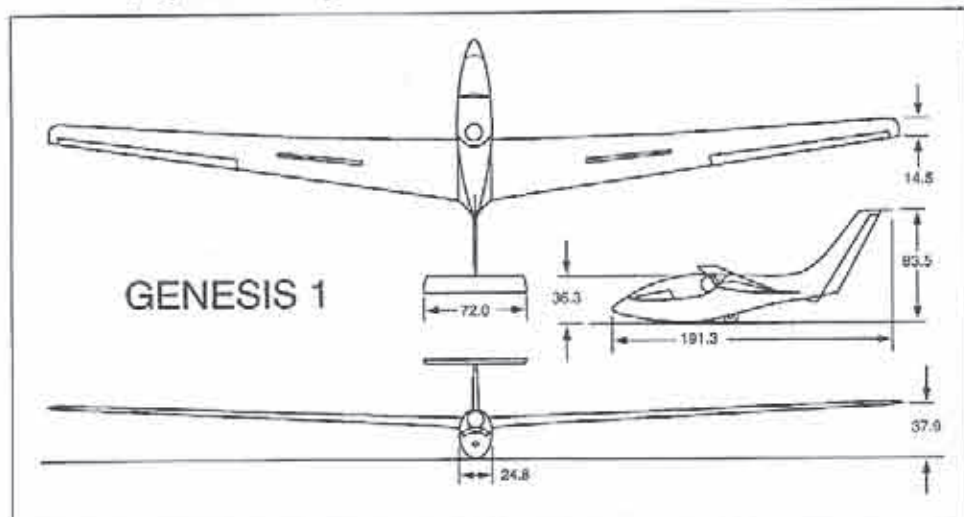
Group Genesis "Genesis 1" and "Genesis 2"

In 1988, we received a letter from Jim Marske, designer of the Pioneer II series of tailless sailplanes. The letter explained how John Roncz had come up with some excellent airfoils for aircraft using the Pioneer II planform. These new airfoils demonstrated laminar flow over a major portion of the upper surface and nearly the entire lower surface. This was exciting, as the laminar flow was in evidence over a wide angle of attack range.

A few years later, in 1994, we saw an advertisement for the Genesis 1 sailplane in the May issue of *Kitplanes* magazine. The included 3-view, although small, portrayed the Genesis 1 in an impressive manner. Contacting the factory netted us a very nice letter from Jerry Mercer, and promotional informa-

Genesis 1 Specifications		
Structure	Composites: Hexcel fiberglass throughout, carbon fiber spar caps, and Kevlar layers around cockpit	
Airfoil	Roncz G-74S	
Wingspan	15 meters	49 ft. 22 in.
Length	4.87 meters	15 ft. 114 in.
Height	2.13 meters	6 ft. 11-1/2 in.
Wing area	11.20 m ²	120.5 ft ²
Aspect ratio	20.2	
Empty weight	223 Kg.	490 lbs.
Payload	303 Kg	667 lbs.
Gross weight	525 Kg	1157 lbs.
Maximum wing loading	46.9 Kg/m ²	9.6 lbs./ft ²
Maximum L/D	43.2 @ 120.6 km/h*	43.2 @ 74.9 m.p.h.*
L/D @ 100 knts	29.5	
Minimum sink	0.58 m/s @ 83.47 km/h.*	1.9 fps @ 51.75 m.p.h.*
Stalling speed	68.6 km/h.*	42.6 m.p.h.*

* = estimated



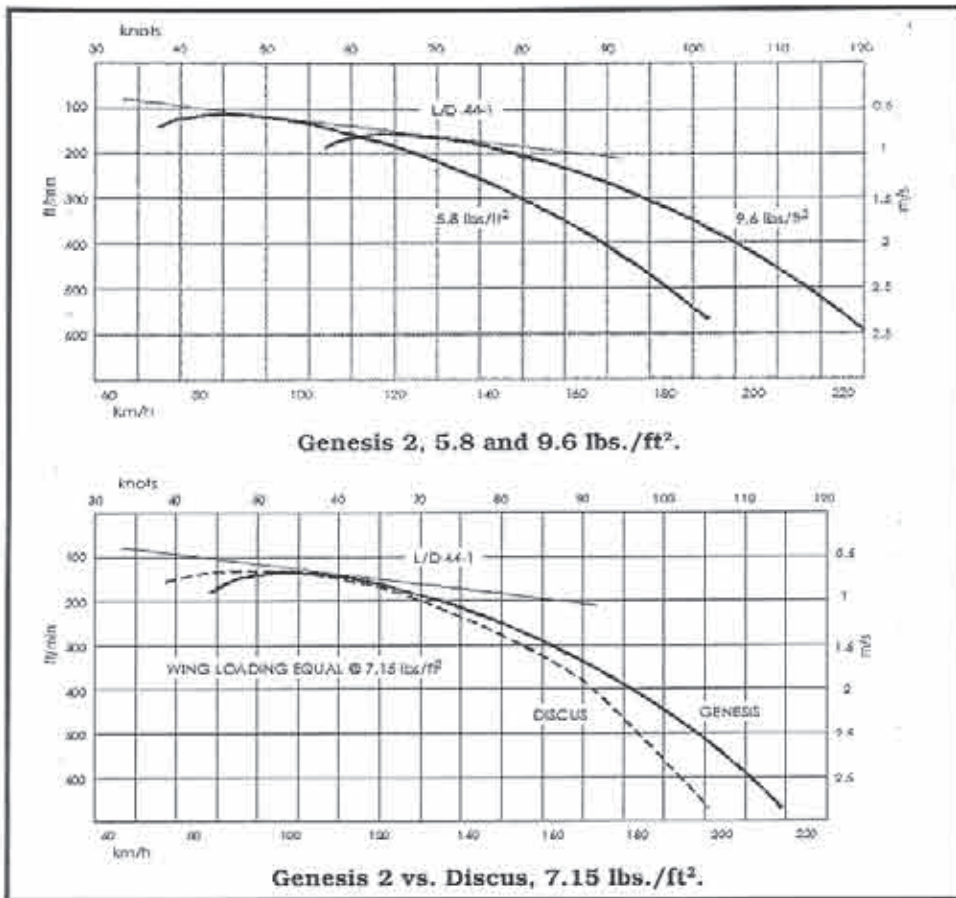
tion sufficient to build a scale model.

The Genesis was designed to meet a goal - design the best Standard Class sailplane in the world - by achieving several objectives:

- take advantage of the efficiency of a tailless planform;
- produce a superior product at a lower price;
- achieve better performance than Klaus Holighaus's Discus while maintaining relatively docile handling characteristics.

Engineer for the Genesis project is Jim Marske, of Pioneer and Monarch fame; the airfoil was designed by John Roncz, best known as the designer of the airfoils used on the 'round-the-world Voyager.

Genesis 1 was developed nearly entirely on computer. A complete description of the



An overhead view showing the gently forward swept wings.

lighter through better mechanical advantage, a changed aileron aspect ratio, and new aileron hinge points;

- a new canopy separation line gives better visibility.

The included polars show the performance of the Genesis 2 at wing loadings of 5.8 and 9.6 lbs./ft², and against the Discus at 7.15 lbs./ft².

The Genesis 2 is currently being manufactured by Sportine Aviacija, formerly LAK (Aircraft Factory of Lithuania). A completed Genesis 2 sailplane, certified in the Experimental/Racing category, is \$44,900 (U.S.) FOB Lithuania.

Charlie Fox, of Davenport Iowa, built a 1/3 scale "proof of concept" model of the Genesis 1 for Group Genesis. The model is capable of very steeply banked turns and thermals easily. Gordy Stahl wrote about Charlie's model in the February 1995 issue of *RCSD*.

For more information contact:
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 Phone: (614) 387-9464 FAX: (614) 387-0501
 E-mail: groupgen@aol.com
 WWW: <http://www.groupgenesis.com>

All photos included in this article are from the Group Genesis web site. For a movie of the Genesis in flight, download the following file: <http://www.groupgenesis.com/glider.mov>. ■

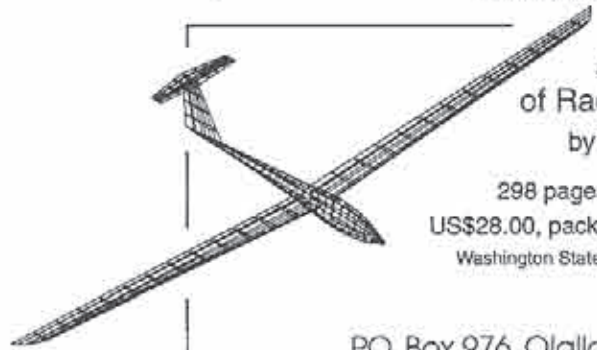
design process, including software used, was published in the September 12th 1994 issue of *Design News*.

The Genesis has forward swept wings, a short fuselage, and a "thresher" vertical tail. It is a tailless sailplane, despite what looks to be a horizontal stabilizer at the top of the vertical surface. That horizontal surface is a full flying trim tab, used only to set the angle of attack of the wing. Its position is as far aft of the CG as possible, thus providing a maximum lever arm, thus reducing required deflection angles. The wing sections, sweep, and wing twist have been designed to make the main wing entirely self-stabilizing.

Maiden flight of the Genesis took place on November 15, 1994. Optimization of the design came through several hundred hours of flight testing, over half of which were flown under competition conditions.

The improved design was given the name Genesis 2, and includes the following improvements over the Genesis 1:

- Genesis 2 will be almost 150 pounds lighter, allowing a greater wing loading range;
- aerodynamic twist was reduced by nearly two degrees, improving climb and high speed performance;
- the wing tip and outer wing airfoil sections have been refined to generate more lift while creating less drag;
- a retractable nose wheel has been added;
- fuselage contour lines and fairings have been smoothed and modified to reduce airflow separation;
- the leading edge radius and airfoil section on the vertical stabilizer have been modified also to reduce drag;
- aileron control forces have been made



Aerodynamic Design of Radioguided Sailplanes
 by Dr. Ing. Ferdinando Galè

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(The Wing Is The Thing)

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines. Full information package including one back issue of newsletter is \$2.50 US (\$3.00 foreign). Subscription rates are \$18.00 (US) or \$22.00 (Foreign) per year for 12 issues.

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 El Cajon, CA 92021



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Aerobatics - Introduction

Well, here go are again, so fasten your seat belts and let's explore a couple of new tricks in the wonderful world of aerobatics. These two can be done by almost any aileron ship; with only a little practice, both will be at your fingertips in no time at all.

You will find that the Split-S and the Roll will be most useful when you start to string together several maneuvers at a time. They will serve you well as a sort of all-purpose adhesive for the ballet you will be putting together in the blue yonder. Don't be surprised if you turn a few heads, but first things first...

These two maneuvers should be quite easy for most of you to master in short order. Just remember that when you tackle anything new, go out and fly a practice session trying nothing but that one new maneuver. Do this until you begin to lose your concentration; then *RELAX* and try again a little later. A few minutes of paying attention will help you more than mindless sky burning for hours. If you take this training approach, you will be pleasantly surprised at how quickly you will be able to master your new "trick of the day".

You might think that other guy is a great pilot, and that he has a "gift". He was just born that way. While that's true to some extent, if he's a real hotshot, you can bet that he's spent many hours practicing - whether he admits it or not.

For you rudder only folks, these stunts will be a little harder, but not impossible. If you master these, you should congratulate yourself, because you will be accomplishing quite a difficult task.

For those of you with flight simulators (I love *Flight Unlimited* hooked up with the Dave Brown flight box.), these aerobatics will be at your fingertips in just a few seconds. Learn them on your computer first; then once you know what inputs are necessary, go out and try with your sailplane - you will be way ahead of the game!

Now, let's buckle up tight, and here we go; hold onto your hats and let's have some fun...

The Split-S or Wing-over (difficult for R. + E., easy for A. + E. + R.) a turnaround maneuver

The Split-S is a very handy turnaround maneuver, because it's one of the easiest maneuvers to do. It's also an excellent introduction to the beginnings of a roll. (As you will see, it's a 1/2 roll.) It's also an excellent and gentle way to check out your favorite sailplane to see if it *will* roll.

The model flies level, then does a 1/2 roll to inverted, hesitates, then completes a 1/2 loop and flies level in the opposite direction.

Your glider will very probably need some airspeed to complete the 1/2 roll. If so, point the nose down a bit and, when ready, try the Split-S. You will need *only* enough airspeed to execute the 1/2 roll and *no* more. Once you are inverted, you are home free, because the 1/2 loop will be going *down* and will be very easy to do.

As with all aerobatics, the trick is to fly only as fast as you need to in order to accomplish your objective which, in the case of the Split-S, is mastering the 1/2 roll. There are two reasons for this.

One is conservation of energy - meaning that you will stay up longer if you don't waste your airspeed. It doesn't take an Einstein to figure out that $H. = E.$ Put simply, for us sailplane folks, height = energy. So, when you point the sailplane's nose down and translate your height into energy, use it as wisely as possible!

This brings us to the second reason for the *conservation of energy*: there's no need to over-stress your wings. While there are a few sailplanes which are built specifically for aerobatics (the Fox, etc.), most others will be quite at home doing aerobatics, as long as you don't forget to fly them with a little TLC!

Once you have tried the Split-S a few times, you will wonder how you ever lived

without it. You will quickly notice that at the end of this maneuver you have picked up *airspeed*. So now what?

Well, use that *energy* for something else! A high speed low pass, a loop, or any other maneuver requiring *speed*. Or, how about a roll?

The Roll

(difficult for R. + E., easy for A. + R. + E.)

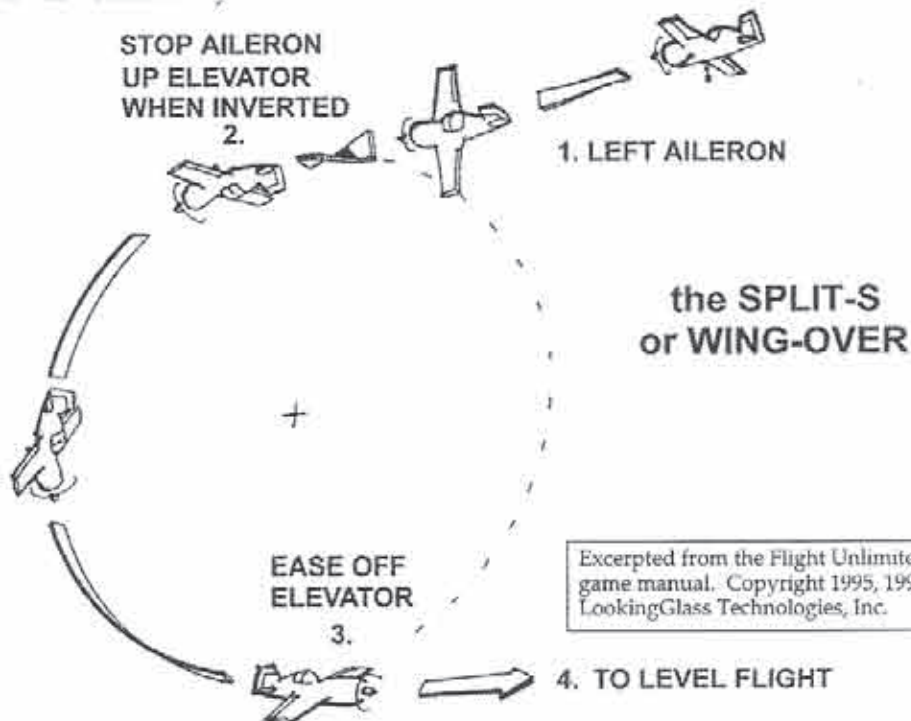
You can do a roll with elevator and rudder only, although your roll will probably end up looking more like a "barrel roll", which is a horizontal spiral. No harm in trying! You need to go into a roll with enough steam for the glider to complete a 360° roll.

"The model rolls at a uniform rate through one (1) complete revolution in either direction. The center is the inverted portion of the maneuver." (Used by permission from the AMA rule book.)

For an aileron ship which "likes" to roll, all you need to do is build up enough airspeed; give full aileron making your glider roll. Sometime *before* your sailplane is back level, stop your ailerons and your sailplane will be flying straight and level again. The trick here is to have enough *airspeed* to complete a 360 degree roll, and to stop your aileron a little before the completion of the roll, so that your glider will end up flying exactly straight and level. Obviously, it takes a bit of familiarization with your particular sailplane to find out *when* to stop your ailerons and *how much* aileron control you will need.

Variations on this, depending on what your particular sailplane requires, are:

1. If the roll rate with ailerons is excessively slow, point your nose down to get some airspeed. Add a bit of up elevator just before you start your roll. This way you will start nosed up at the beginning of your roll, while the end of your roll will be nosed down.



Aerobatic Flight Plan

October 1997

- Uncouple your rudder & ailerons.
- Practice flying Straight & Level.
- Master airspeed.
- Practice the Inside Loop.
- Determine what rudder & aileron adjustments are required to fly a perfect loop.
- Tackle Inverted Flight.

November 1997

- Practice the Split-S or Wing-over.
- Practice gaining sufficient airspeed to be able to complete a 360° Roll.
- Practice The Roll.
- Combine maneuvers to develop your personal, custom, aerobatic sequence.

Notes:

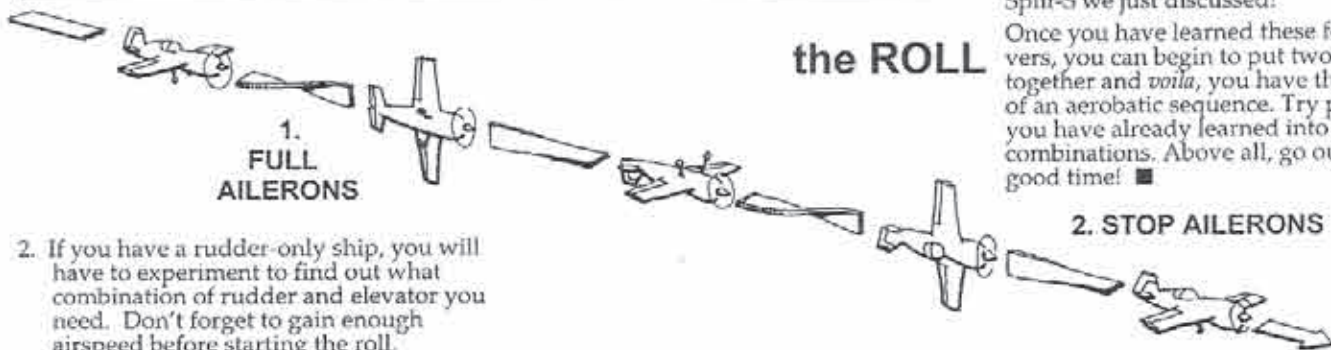
- Establish and maintain a "Sailplane Diary" for each plane.
- Review monthly progress.
- Practice flying with a knowledgeable friend or expert, and remember that safety comes first.
- Practice with a flight simulator program such as Flight Unlimited (April, 1997 RCSD).
- Definition of "One Mistake High": Be darn sure you're high enough to complete the maneuver and make one mistake, before hitting the ground.



near INVERTED, so you won't lose too much height or pick up too much airspeed at the end of the roll. Be gentle on your glider's wings! Too much airspeed will put excessive loads on the air frame! Just think: a 5 lb. glider may pull 6 or 7 Gs in a tight loop, meaning the wings will have to carry 30 to 35 lb. Gently, gently into that good night...

As always, when practicing, make sure you have enough height to get out of trouble. Try your first rolls at least one loop high. What I mean by this is fly high enough so that if your glider can't make a full roll, you can always pull back on the elevator (up elevator) and do a GENTLE 1/2 loop, if necessary, to get out of trouble. That's the Split-S we just discussed!

Once you have learned these few maneuvers, you can begin to put two or more together and *voila*, you have the beginnings of an aerobatic sequence. Try putting what you have already learned into different combinations. Above all, go out and have a good time! ■



2. If you have a rudder-only ship, you will have to experiment to find out what combination of rudder and elevator you need. Don't forget to gain enough airspeed before starting the roll.
3. Remember what down elevator does when you're inverted? If your roll rate is slow enough, you might need a bit of DOWN elevator when the sailplane is

Excerpted from the Flight Unlimited game manual. Copyright 1995, 1997 LookingGlass Technologies, Inc.

Elmira Aerotow "98" Update!

By John Derstine
Gillett, Pennsylvania

To all those anxiously awaiting further details on next year's edition of The Harris Hill International Aerotow Festival, great news! We have permission to use the Harris Hill facility for four days, June 11-14. Here is how it will go:

June 11 - Thursday: Open flying for early arrivals. Frequency board in use. Field for our exclusive use; no full scale traffic.

June 12 - Friday: Official event starts; impound in use; exclusive use of field for R/C again. Friday evening: picnic at Harris Hill youth camp, adjacent to field.

June 13 - Saturday: More aerotowing, and full scale sailplane rides. Field will have both full scale and model traffic. Saturday evening: banquet at National Soaring Museum.

June 14 - Sunday: More of the same if you can stand it! Again, we will share the field. More details will follow shortly. Plan your vacation now for one of the best Scale R/C soaring venues in the US.

We also have slopes. A few more will be added to the list, as we have discovered yet another good slope or two in the area, not to mention Harris Hill at 900 feet above the Chemung Valley.

If you want to practice, or learn aerotowing

techniques, plan on coming early (Thursday or Friday) for a more relaxed atmosphere.

See you in June!

John Derstine

<http://www.Geocities.com/CapeCanaveral/Lab/5739>

johnnders@postoffice.ptd.net

Co-sponsored this year by: Harris Hill L/D R/C, The National Soaring Museum, The Harris Hill Soaring Corp. ■

Sailplane Homebuilders Association (SHA)

A Division of the Soaring Society of America



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

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

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1/3 Pribek ASW 27 - 5 meter span (196"), wing profile HQ 2.5/12, ca. 20 lbs.

1/3 Müller Discus - 5 meter span (196"), wing profile HQ 2/12, 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.

1/4 Roebers Pilatus B-4 - 3.75 meter span (147"), wing profile Ritz 3, approx. 8 lbs.

1/4 Roedel Piper Super Cub (scale towplane) - 2.687 meter span (105"), wing profile Clark Y mod., approx. 15 lbs. This airplane is partially built. It requires additional building and covering. Suitable motors are OS 160 T, OS BGX-1, Brison 3.2, or similar.

1/4 EMS DG 800 with electric pop-up motor installed - 3.7 (145") to 4.2 (165") meter span, wing profile HQ 2.5/14, ca. 7.5 lbs.

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1/3 ASK 13 - 5.33 meter span (209"), wing profile E 68-67-66, ca. 32 lbs. Completely built & ready to fly with all servos installed, brand new, unflown.

1/3.5 Roke DG 202 - 4.86 m span (168"). Completely built including all servos.

Orta all glass ASW 24 (1/3.3, 4.50 m/177" span), mint condition, includes retract, nose release, all Futaba servos installed, completely ready to fly.

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VOLUME 2, NUMBER 3

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Congratulations!

First off this month, I'd like to extend a hearty congratulations to Daryl Perkins for earning another F3B World Championship title at the '97 World Air Games in Ankara, Turkey, and relay our appreciation to the US F3B team, Gordon Jennings, Randy Spencer and Joe Wurts for their strong effort. Our team was ultimately defeated by the Swedish team; no small feat! Congratulations to Sweden... Enjoy it while you can!

More Sticky Topics

As the foamie technology marches on, the base of experimenters and tinkerers has widened considerably and some new and better methods of working with EPP are coming to light.

One of these I mentioned recently was DAP Weldwood Contact Cement, which was recommended by Mark Mech of Aerofoam in Tempe, Arizona. Mark spoke so enthusiastically about this stuff as a replacement for 3M Super 77 that I just had to give it a try... And work it does!

Mark's preferred covering technique differs from my own considerably, as he uses 1.5 mil sign vinyl in lieu of iron-on films. He also likes to apply a layer of ordinary packing tape over the foam prior to application of the sign vinyl. So, I wanted to see how this stuff worked with iron-on films.

The DAP Weldwood Contact Cement comes in a few varieties, but of note to us are the 'Liquid' and 'Gel' types. Mark recommends the original, liquid formula, but I was only able to obtain the 'Gel' variety at my local hardware store, and it did give me very favorable results. Here's the procedure I followed...

I cut myself a disposable brush out of some scrap EPP. Dip it into the cement, then brush onto the part. It does tend to soak in a little, so it pays to work fast. The stuff is VERY sticky, and handling the part as you go is still challenging. One way to minimize this is to let the cement cure a little



Yours truly applies DAP Weldwood Contact Cement to a fuselage prior to covering.

before handling it, as it's fairly reasonable to handle after ten minutes' drying time. I did the aft end of a fuselage, paused, then did the fore end.

After letting the cement set up about fifteen minutes, I commenced with taping and covering. The tape sticks great over the Weldwood, and will actually take good size pieces of the EPP with it upon removal, so you need to be careful about application. Ultracote covering came next. I used my typical high heat settings which worked fine, and my usual technique of covering the parts entirely before the final 'super shrinking'. After completing this, I did the peel test... The Weldwood stuck so well on the foam that removing some foam with the Ultracote is inevitable; it sticks like crazy! Ordinary mineral spirits (paint thinner) worked great for cleanup of residue left on the covered plane and my iron.

So, thanks to Mark for this idea! Applying the liquid or gel contact cements is not as quick as spraying, but the results are terrific and with a little care will leave your hands much less sticky. One caution is to be sure and do the application of the cement outdoors, because it stinks to high heaven... A lot worse than '77. After it's cured, the odor is minimal and I didn't experience any fume problems as a result of the ironing.

I also tried this stuff with Monokote, and it worked better than with 3M Super 77, but still not as good as Ultracote. It did stick well enough to make Monokote a viable choice for covering, though, especially on EPP airframes that won't see combat duty.

Alternative Covering

I recently received from Ed Harris a sample and specifications for 'ThermalSpan' covering material. This stuff is sort of like Silkspan on steroids; it's a non-woven, non-directional, extremely tough and tear resistant fabric. It's also capable of accepting paint, which is a very nice feature. It comes in 2.2 mil x 14 inch x 16 foot bolts in a translucent white color.

Included in the package was a piece of EPP with the ThermalSpan applied to one side. Ed used Sig 'Stix It' to apply the material and the bond is strong enough to take foam with it when peeled. I consider this the number one test of a covering system's efficacy, and it does indeed pass the test. Over the ironed-on ThermalSpan, two coats of Minwax Polycrylic sealer were applied. The surface is smooth and very wrinkle resistant. The best thing of all about this material is it's light weight - .9 ounces per sq. yard.

Ed goes on to say that the water based Minwax Polycrylic used as an adhesive makes ThermalSpan practical to use over conventional styrene foams. It's also excellent for use over wood structures as a strengthening agent and base for paint finishes.

For EPP handlaunch planes, this stuff may have real potential, and on conventional, wood structure aircraft would be a very nice choice indeed. If you're interested in getting hold of some, drop Ed a line at: Harris Design, 2000 NW 84th Avenue, Ankeny, IA 50021; (515) 965-5942. Price for

a 2 sq. yd. + package is \$10.00 postage paid in the US (Ed will pay the postage on up to three packages.). The package contains detailed directions for application over wood structures, and the information on foam applications is as you see here. Give it a try and see how it works for yourself!

Rules Proposals

At the last LNSSG combat contest, one new concept was tried, and another proposed. Many fliers have commented on the relative disparity of flying wing and conventional style airframes' lift requirements and recovery characteristics, and have voiced the desire for separate classes at events for the two formats. I've personally resisted this distinction, as the 'free-for-all' competition with fewer rules has always appealed to me. However, we did give it a try at our latest event. Here's how it worked out...

We ran two classes, which amounted to essentially two separate events with separate trophies. One was an 'Unlimited' class, which allowed any airframe that fell within the current rule structure to compete. This could be a wing, a conventional or any other imaginable concoction... The usual deal.

The second, new, class was a 'Conventional' class. This also stuck with the existing rule structure with the exception that all the planes must be of conventional (tailed) design. The majority of the planes run were scale-type airframes, and the rule-change proponents were gratified to see the scale look come back to the contest format.

The two events were run concurrently, with alternating rounds for the two classes. This insured equal distribution of the day's lift conditions for the rounds in both classes. Most of the Conventional class pilots also ran in the Unlimited class, so I simply split the score tables on their score cards to reflect their standings in each class (i.e., two separate contests scored on one score card). This proved extremely cumbersome, so for future events I'm going to have the general entry and registration information placed on one form, and use separate score cards for each pilot for the separate classes. This will also necessitate the use of a separate matrix board.

The new format seemed to be well received, and many of the pilots liked the opportunity to get more stick time during the event as well as having a chance to go home with two trophies instead of one; which a few did! As CD, I don't think there were too many mechanical problems with scoring or structuring the rounds, and with separate matrix boards it would be pretty easy. We had 21 entrants with about half of these running both classes, so it was a busy day for me!

After the event, I grudgingly agreed that it did work well, and was even treated to a conventional aircraft, winning the Unlimited class! The upshot is that our club is going to continue running the events this way for the remainder of the '97 season and codify it carefully for '98.

The second proposal, put forward by Lex Meirup, was to include a total flight duration score along with the kill tally. Why? Well, a popular practice, particu-

larly in light lift conditions, is sandbagging... Guys will stand on the edge of the hull waiting for the first guy to launch, then commence to launch on the poor soul as he flies by (SAM launch). Although SAM launches are of mediocre value, they can gain scores for the SAMers. Having flight duration scores could help to keep more planes flying and the pilots working in the light lift cycles. Since every pilot has a score keeper, it would be easy to have a stopwatch in use, too. The pilot with the highest flight time could be awarded a bonus kill for his flying efforts. This is another change I'm considering testing out in the real world; I know of one pilot in the last contest that could have been bumped into the final round had this rule been in place.

Reader's Ride

Ah, yes... Another PSS beauty this month! Gerry DuPont sent me some pics of his Ki61 built from a DAW kit for my own edification, but the paint work is so stunning, I just had to show it to all of you! The plane was built from the kit per plan, then glassed with 3/4 ounce cloth and epoxy resin. Over this was applied K&B Super Pox paint by airbrush. The rarely seen giraffe style camouflage is wonderfully executed, as well as the carefully completed fade-out edges on the canopy glazing. One other slick trick Gerry uses is a fade edge ring of black around the spinner to simulate the look of the rotating prop blade roots. Total weight is 18 1/2 ounces.

Believe it or not, this plane has over twenty hours of flight time on it! Gerry says, "Although she's been damaged on several occasions, I find myself doing seamless repairs to keep her looking pristine. I suppose when other fliers see it up close, they figure I don't put much stick time on her... That is what they probably think, until they see her in the air!"

Nice work, Gerry... I can't wait to see your next project!



Gerry DuPont of South Dartmouth, MA and his fantastic Ki61 Hien. Take a look at that awesome paint work, including powder stains behind wing guns and exhaust residue over wing roots! Tom Graeber photo.

Back to Business...

So, that's all for this month, folks. I'd like to say thanks to those of you who've continued to call and write with your suggestions, and will be hitting on a number of those for the next few columns. 'Til next time, keep 'em sighted and locked!

Kontest Karma

...by John Roe
Laguna Hills, California

During the September SC² contest (one of a series of regional open thermal contests, which the various clubs in Southern California take turns hosting) in Costa Mesa, I pulled a move which may be familiar to some of you who compete in Thermal Duration... I had made my seven minute time in fairly challenging air, set up my landing, and shot a very satisfying approach to the landing tape, "sticking" my Esteem nearly right on the money, only two seconds over. YES!! Except...

The number on the tape where the nose came to rest read "12"! I was stunned! I had flown directly to THE WRONG END of the landing tape! Instead of an 88, I had a 12!

I was unable to immediately accept this. I had done nothing wrong! It was my timer's fault for stretching the tape the wrong way! I should be given credit for my landing where I THOUGHT I was supposed to land! Right?

Well, my timer, Mark Navarre, said, "No way, Jose! You always land at the far end of the tape and put the zero nearest you (true), and even if we HAD mis-communicated, the sin of the timer is the sin of the pilot!" So, he wrote down the evil 12.

I spoke with the contest director, Rick Briggs, who chuckled and said, "You too, huh?" So, I kept my 12...

My next flight was the last task, ten minutes, and started very well with some good lift upwind of the winches, which Mark Navarre was suspicious of because the thermals there had been "going away" with some regularity according to him. I hadn't noticed. After a couple of minutes of slowly climbing, it seemed that I was slowly losing altitude. Mark was expecting that, and had been advising me of good lift that he felt could be reached WAY downwind, IF I bugged out with enough altitude. I did, and once again I must say I LOVE flying a plane (Grand Esteem with a 7080) that can cover ground big time! Way downwind I hooked a big one, and was reassured to see Fred Sage (a master pilot) blasting after me, going for my air. I spent the next 7 or so minutes testing my eyesight, then came in for my time and a 97 landing, my best to date! It was enough for a first place in Sportsman, and a really cool Crystal trophy with an eagle engraved on it! (Thank you, HSS!)

Mark told me if I HAD succeeded in bullying him into giving me the "88", my plane would have exploded on tow, and the pieces would have rained down on my head while everyone laughed at me. He's probably right. I learned a good lesson that day.

Mark and I talked about how Daryl Perkins had shown his honesty and sportsmanship at the recent F3B world championships, where he brought to the attention of the contest officials the fact that his turn-around pulley stake had pulled out of the ground during a launch. They hadn't noticed, and even though it meant a "zero" on his scorecard for that round, Daryl just had to let them know. He went on to win and, with his example and my recent experience, if it had happened to me, maybe I could do the same. Just maybe...

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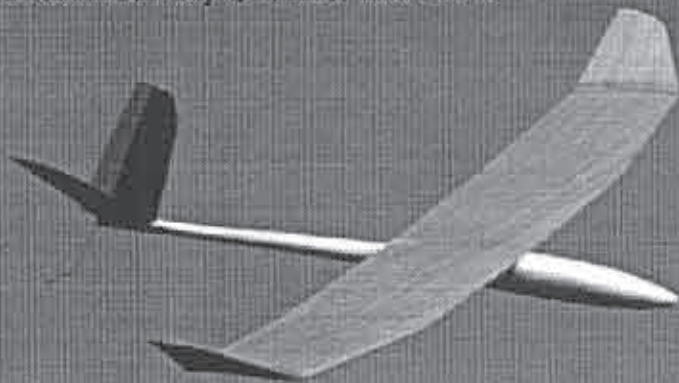
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Simprop Fashion R/C HLG Review



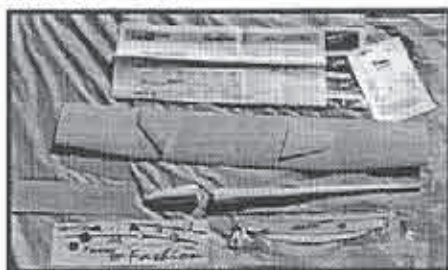
The Electric Connection

By Mark Nankivil
7411 Canterbury Ave.
St. Louis, Missouri 63143
(314) 781-9175

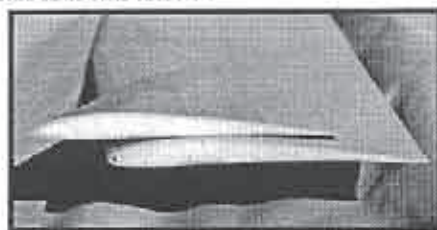
The Fashion HLG is a new hand launch glider from the German firm of Simprop, and is being imported into the U.S. by Andy Fok at Unbeaten Path Imports. I first saw the advertisement for Unbeaten Path Imports in *R/C Soaring Digest* and the ad featured the Fashion which intrigued me. When I got the chance to review the model, I jumped at the opportunity.

The model comes in a stout box that can take the abuses of shipping. When opened, you'll find a pre-sheathed obechi/white foam wing, with separate outboard wing tips using the Selig S4083 HLG airfoil, a light fiberglass fuselage pre-colored a bright white, a separate fiberglass nose cone/sheath, die cut light ply parts, pre-cut balsa tail feathers, pushrods and fittings, decals, and a comprehensive instruction sheet with drawings. The model can be built as either a Speed 400 powered model or as a hand launch glider. Initially, I looked at building the model so that it can be converted back and forth between the two versions, but it was difficult to get a reasonable CG set up that worked for both models. You would be better off to choose one or the other version and stick with it, or just buy two models! The specs on the model are:

Wingspan - 58.4 inches
Length - 33.5 inches
Wing Area - 387.5 sq. in.
Stab Area - 14.6%

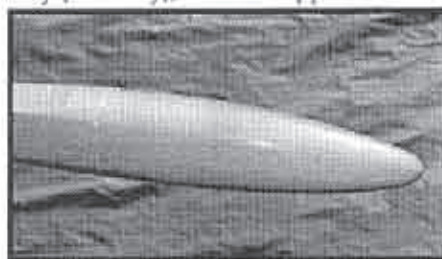


The wing is interesting in that the center panel has the center and tip dihedrals already pressed into them during the sheeting process. According to Andy at Unbeaten Path Imports, Simprop uses a CNC machined wing mold and the wings are bonded and pressed under both pressure and heat. I started on the wing by sanding the leading edges to shape, using templates created with Compufoil Pro software. I checked airfoil accuracy for the whole wing and it was a very, very close match to the S4083. This airfoil was specifically developed for HLG models and this is only the second HLG kit I have seen that uses this airfoil.



Note the use of the obechi doubler on the inside of the lower skin and in the nose of the wing.

The use of obechi makes for a heavier wing, but on the flip side, it makes for a stout wing! The instructions do make mention of the option of cutting lightening holes in the wing, but for the review I chose not to do that. After sanding the wing, I joined the tip panels with white glue and then put a 1/2" wide strip of .6 ounce fiberglass cloth over the joint top and bottom. I then finished the wing with multiple coats of Flecto Varathane Diamond Finish Elite. I used the Semi-Gloss spray can version of this product and applied light, fine coats until I started to see a bit of "gloss" on the surface. I followed this with a light sanding using 400 grit wet 'n dry (used dry), and then applied one last



coat before I set the wing aside. The wing weighed in on the heavy side at 7.3 ounces.

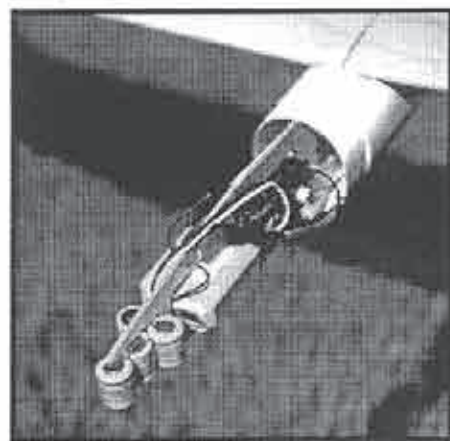
The fuselage is a very nicely molded piece of work. The fuselage and nose cone/sheath already are painted in the mold (possibly pigmented) a bright white color and weighed only 2.1 ounces.

The light ply parts were easily popped out of the sheets - the die cutting is excellent and the best I have seen in a long time - and the appropriate pieces for the HLG version were sorted out. The radio equipment in the HLG version is mounted on a keel - ala F3B style - and this makes for a clean installation of the radio equipment as the photos show. With the keel

assembled, it was glued into the fuselage, taking extra care to assure that it was aligned properly. I also cut out the finger hole for throwing the model as per the instructions. I toyed with the idea of a cross bar for a two finger throw, but I felt the fuselage was just a bit too wide to be comfortable throwing that way.

The V-tail was assembled and the wood supplied was firm but light - excellent for the purpose. I did put some lightening holes in the fixed surfaces as every bit of extra weight taken out of the back end helps. I deviated a bit from the instructions, which use an aluminum strip for the control horns on the elevator. Instead, I made up two control horns out of 1/32" ply and glued and 'glossed them into place. I finished the surfaces off by covering them with Monokote. The V-tail surfaces are glued into a V-block that is itself then glued on to the rear of the fuselage. I'd suggest tacking the V-block into place; after initial flights and trim are set, you can adjust the incidence and then permanently glue it into place. Once in place, it was time to cut the pushrods to the correct length and hook up the elevators to the servos.

The radio equipment set up in my Fashion HLG consists of a lightened JR credit card receiver, two Cirrus CS-20 sub-micro servos, and a 150mah NiCad receiver pack. The receiver pack needs to be made up as shown in the photos, otherwise it won't fit within the forward taper of the nose cone/sheath. Be sure to trial fit the pack before wiring it up.



With the model fully assembled, it was time to balance it on the CG shown on the plans. Mine required an ounce of lead to balance (ugh) and final weight ended up being 16.5 ounces.

It took a while for me to find the time to get out to the field and fly the newly completed Fashion. Finally, the chance came, and the day was well worth the wait. First throws showed the CG to be a bit forward, so a little lead was taken out and the pitch response improved accordingly. Harder throws showed a straight out climb with little to no ballooning. I will later increase the V-tail incidence a half degree or so and see what that does to flight trim. Considering the slightly higher wing loading of the model, it flew and circled well though the speed must be kept up a bit to keep from stalling. I think the Fashion would work well off of a zip or mini hi-start, so I have placed an order for one. Besides, my arm is getting tired with age! I also plan on using the Fashion for some light slope soaring where it ought to scoot along quite well.



Clubmate Eric Lund holding the Fashion to give an idea of the overall layout of the model. The Fashion is a well presented and kitted model that makes into a good sport HLG and light slope model. The instruction manual and plans are useful and well detailed; the overall kit quality is excellent. The one drawback is a wing that needs to be a couple of ounces lighter. I really like the fuselage and keel layout and I'm tempted to order a spare fuselage for an O/D model I have in mind.

You can order your Fashion HLG from Andy at Unbeaten Path Imports, P.O. Box 271, Oconomowoc, WI 53066, or see Unbeaten Path Imports on the 'Net at <www.unbeatenpath.com>.

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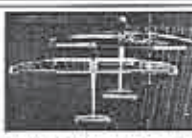
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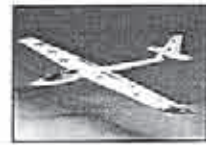
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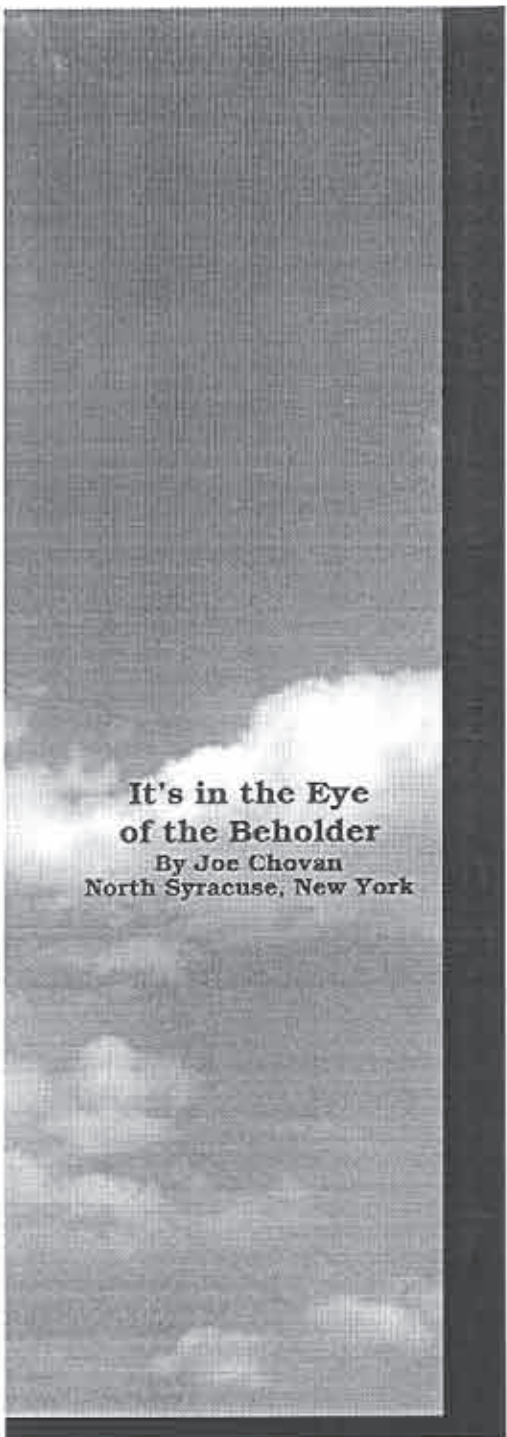
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It's in the Eye of the Beholder

By Joe Chovan
North Syracuse, New York

tarily, but the key theme will hold throughout. So, having been warned, read on if you're curious.

I like building "beautiful" planes. I really appreciate a beautiful design, and trying to do it justice in bringing it to its full functional form — a form dedicated to flight.

I'm sure you've heard the term "beauty of form". To me, nothing is more beautiful than a cheetah in sprint, a stallion at full gallop, or an eagle on the wing. These are some of nature's masterpieces in design. Each fills a niche in the ecology that helped to shape it over eons, and each has been refined to master the domain of its existence. Each, by virtue of its physical form, performs a task that no other can master quite as well — a pinnacle, that is inspiring.

It may be important to note here that these animals are amazing, because of what they can do. We admire the features of powerful muscles, svelte figures, and aerodynamic profiles, because we know they are necessary to the tasks performed. We may also see a certain attraction to these traits that may be more difficult to explain.

Most designers know that any design is a compromise. If you want to go as fast as possible, you are going to hamper maneuverability in some other area. There is no avoiding that. Full scale plane designers have a score of specifications to meet, and have done wondrous jobs in creating machines to perform these tasks. Some truly beautiful craft have emerged. Who in their right mind would ever call a P-51 Mustang, a Salto, or a Mig 29 Fulcrum ugly? Even the A-20 "Warthog" has a certain charm.

A primary concept these craft have in common is they must carry a person. That's a consideration in most any scale subject. One might be tempted to argue target drones, buzz bombs, missiles and other unmanned, full scale subjects can also be "beautiful", but I'm building to a different point here.

In scale modeling, a designer/builder is setting a goal to recreate in miniature an accurate rendition of a design intended to fly within a certain set of parameters. Now, here's the bomb: none of these parameters exist in model flight. If one wants a design to fly optimally a certain way, one would not design a cockpit in a plane that doesn't have to carry a person, and most likely, one would not build it to the same size or shape as a similar manned craft. This means it can be built stronger, or lighter, or perhaps with less complication if it can somehow control itself without a being on board.

As model airplane flyers, we have tremendous advantages in not having to subject ourselves to the rigors of flight. We have tiny little plastic and metal boxes that we can distribute throughout our planes (wherever prudent design mandates) to house the brains and brawn that will guide and control our aircraft.

Our birds are much stronger and more nimble than their full scale counterparts, and can take advantage of whole new flight envelopes their larger cousins can never approach. This is decidedly "non scale" flight, and while dismissed by some pilots,

it is relished by others.

A good example is the blinding roll rate of Dave Wenzlick's mini ASK-21. It's difficult to imagine a slope plane rolling any faster. While it may be physically possible to build a plane to do so, it would no doubt suffer in another aspect of performance, or appearance. Regardless, rolling Dave's plane looks like a lot of fun, and judging from Dave's smile as he flies, I'm sure he thinks so also. Dave has a scale plane that performs like no full scale plane can. It's amazing, and beautiful. In my eyes, it's a wonderful plane that just happens to look like a larger one which can carry a person, but I do appreciate Dave's accomplishment in creating such a machine in the image of another.

Judging from the many opinions expressed in past years, gathered from soaring enthusiasts, and written by soaring journalists, soaring flight lends elements of "purity" and "freedom" to one's hobby experience. Like others, I enjoy my hobby partially as an escape from the constraints in everyday life. I've often been asked, "Why don't you get your pilot's license, and go fly 'real' airplanes?" I explain that I can't enjoy the kind of flight I'd like to perform without endangering myself or others, breaking a low altitude speed limit, or violating someone's airspace. The model plane is more than a toy I control through the sky — it's an extension of myself, and the only bounds I face are ones limited by my own skills, the day, or the design. That is my personal version of this freedom, anyway.

Part of my personal joy in building and flying is recognizing the beauty of form, as it allows function. This function is the MODEL's flight, not that of any larger plane's, which might happen to look like my model. This is my model, and I'm free to build and fly it how I wish. I consider myself fortunate, in a way, that I do not need to expend considerable effort in reproducing "scale details" to really appreciate a plane. Scale details often detract from performance, and thus, are usually left out, or downplayed (as is commonly done in PSS subjects). It doesn't bother me if a Spitfire lacks air scoops on the wings, or ammunition blisters. I realize I'm extreme in my blissful negligence, and it's appalling to some, but I'll always bow to another's right to pursue his/her own personal happiness, as long as (s)he allows mine.

I was so pleased to discover slope soaring, and the truly beautiful planes that dominate this arena, because as a gas flyer, I've always lamented having to conceal or ignore the hideous engine cylinder head sticking out of the pointy end of my otherwise aerodynamically trim and aesthetically pleasing fuselage. Ever see a P-40 Warhawk with a side mounted engine's cylinder sticking out right where a shark's mouth should be painted? There is no greater misfortune of necessity in modeling.

That cylinder head isn't just ugly because it wrecks an exciting paint scheme. It's ugly because the air that passes over the sleek spinner, and possibly through a prop, suddenly has this awkward and ungainly

What kind of models do you prefer? Scale subjects? Sport planes? The tall, blonde, long legged kind? Chances are, you would choose a type of model as your favorite for mix of personal preferences in appearance, performance and a knowledge of the subject.

What I'm about to reveal is not an attack against the scale modeler, although some may take it this way if not forewarned. I want to share a facet of what makes building and flying soaring planes appealing to me, and I would wager, a fair number of folks entranced by this hobby. The focus is largely on slope craft, however this subject may appeal to thermal enthusiasts. I'm going to expound on what I consider "beauty" in an airplane, and how it lends excitement to flying. I may diverge to subjects outside R/C soaring momen-

structure to circumvent in its journey past the plane. It's an aerodynamic sin the cylinder has to be there. There are some tricks successfully employed by skillful scale builders who choose inverted engine mounts and methods of concealment, however, these setups add complexity, weight, and sometimes hinder performance.

I'm not sure if the world speed record for a model plane is still held by a slope soarer (The "Dassel" by the Kowalski brothers at 249 M.P.H. in the Austrian Alps — circa 1976), but I've always delighted in knowing that the "most beautiful" type of airplane had risen to the height of this area in model performance. There is beauty in simplicity, and a reciprocating or jet engine certainly is not simple.

When I see a CR Contender, a SIG Samurai, a John Higgins Rodent, or a Mark Wilkerson Scepter, I get excited looking at their sleek lines, in anticipation of speed and power. These planes "own the sky" and a skilled flyer need only think through a maneuver, and it unfolds in grace. A Brian Laird Warhawk or Aircobra has pleasing curves and air-splitting features for the energy craving slope fanatic who also finds pleasure in scale modeling. I hear the shrill whistle of an authentic slope warbird diving past a ridge line and then rolling on command with a "flick" and realize it's an experience that simply must be performed first hand to be fully appreciated. On the other end of the spectrum, a Hangar 4 Whirlwind exudes a promise of unmatched agility in tight quarters, as I regard its lightweight frame and large control surfaces. Sure, it's a foamie, but it's designed and built to excel where few other planes can even fly.

The mere sight of a well-designed slope plane sends my spirit soaring. My mind's eye replays flights I've performed, and I imagine new areas to explore. Will this craft be the one to enact that perfectly round loop? Will this plane give me a faster dive, tighter turn or quicker roll?

A builder can do much to beautify his/her plane. A great paint finish will always impress. But a fine form is key to performance, and an appreciative eye will know what traits are pleasing, and hold promise. Appreciating the gentle curves of a wing's fillets, or the gradual transition from fuselage to empennage isn't a very difficult task. Anyone may see the beauty in an elliptical planform and gently curved surfaces. Sharpness of trailing edges, the point of nose, low profile and overall weight tell of speed. Aspect and planform of wings and length of tail hint of smoothness and turning ability. Small size and light wings tell of rolling prowess. Physics and aesthetics merge into more than mere ideas. One's mind both races and calms with the prospect of enacting a "perfect flight". It's a very primal sort of lust, and fortunately for me, I'm often free to ogle and fondle the planes of others, without provoking any of the reactions I might incur if I had so admired models of other sorts not belonging to me.

The promise of stunning flight is an incredible motivation in building a beautiful bird. As each feature is formed and honed, one's thoughts leave the

basement shop far behind, and soar with the gulls and hawks the object in hand will accompany. The craftsman's hands are guided by skill, and an eye for what what's been learned of nature's air. Science and art, mechanics and motion combine.

In flight, beauty is proven and celebrated. A sleek racer is certainly a beautiful craft. Is the winner of a race in possession of its most beautiful entry (disregarding for a moment, the skills required to fly each plane in the race)? Perhaps. It's also a matter of taste.

The ultimate judge will always be the eye of the beholder, or in this case, the builder (and flyer). I know I'm flying a beautiful plane not because of what it looks like on the ground, or how many trophies I may have won in a static display, or what others may have said about my plane. I'm asking my plane to perform what few others can do. With an appreciation for the physics which allow the possibilities I imagine, I strive to explore the limits in the reality of flight.

These performances often tantalize me



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against backdrops of nature's most picturesque and remote locales. These are fitting places to enact dreams of flight. All I need is a breath from nature to enliven my creation in her theater. Majestic vistas are revealed as the curtain opens, and my creation takes center stage. Hundreds or thousands of feet above the surface, an aerial dance plays between my plane and the zephyrs or gales of the day. The wind whispers and screams as crescendos of motion build and replay over the landscape. My moods can all take flight, and I lose myself in the currents and torrents of living air.

My plane takes me to an apex with each thrilling maneuver, and I can see to horizons formerly hidden without such a beautiful instrument at my command. It's difficult to imagine a greater test of beauty from a fashioned collection of fiberglass, foam, wood and glue. ■

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16th Annual

Last Fling of Summer

Tulsa, Oklahoma

September 19-21, 1997

...by Dave Register
Bartlesville, Oklahoma

It may not be the largest contest in the country. It may not have the most predictable weather. But TulSoar's Last Fling of Summer always seems to be a good show, and this year was no exception.

A predicted cold front stalled on Friday and came through much milder than expected. Friday had temperatures in the 90's with Saturday overcast and in the '60s (how about those 30° temp swings!). Sunday started windy and overcast, but turned calm with scattered skies through the latter rounds with temperatures back up in the high '70s. Pretty typical for our area.

Some 35 flyers came to town for the 16th annual version of this thermal duration contest. The format was HLG on Friday afternoon, 6 rounds of unlimited on Saturday and 4 rounds of 2-meter on Sunday, so we could get folks on the road by mid-afternoon. The flying field is Blue Springs Sod Farm - about 100 acres of Bermuda and Fescue just off the river in Broken Arrow, Oklahoma. Jeff Naber (TulSoar prez) did the CD honors and Maggie and D.O. Darnell co-CD'ed and handled the scoring. Kenny Carpenter, Doug Drullinger and Tom Tapp were the happy winchmeisters who kept things rolling along at the lines. Dale and Donna Nutter hosted an open-house at their place Saturday night to cap off a great weekend.

Winches were the usual Ford long-shafts with 'Real Balls' and Rahun retrievers. Each winch/retriever combo is mounted on a trailer for ease of transportation and set-up. Winch motors are run on 4 twelve volt deep cycle batteries in parallel. Retrievers are run on 2 six volt batteries in parallel. A portable generator hooked to a separate charger for each winch kept all the equipment 'hot' for all rounds. If you could carry it to the winch area, we could launch it.

Mickey Sullivan (KSSOAR) brought his semi-scale Schweizer 1-26 and flew unlimited. Mickey uses an ROG technique that's really neat to watch. Roll out landings on the wheel are really fun and Mickey drew a crowd whenever he put his ship up.

Art Slagle and Vergil Spangler worked together on Art's amazing Banzai launch. Art sits on a stool while Vergil holds the Duck. Art mashes the winch peddle while Vergil hangs on until he's almost launched himself. The Duck rips out of his hands and lets go with a sonic boom in the first 40 feet. Pretty impressive, but it works!

Joe Naber (CD's dad) came down from St. Louis and loaned junior one of his open class ships 'cause Jeff ripped up his Peregrine a couple of weeks back. Jeff proceeded to de-wing Dad's ship on the first launch. The fuselage timed out at 4 seconds and the right wing at about 93 seconds, with an off field landing in the cow pasture (No points!). Joe's comment, "I

GOTTA stop letting that boy fly my planes!"

The Frickey brothers (Mike and Jim, the winner of team high points at the NATS) came down from Kansas City area and flew their respective V's all the way into the fly-off. Mike's radio conked, so Jim flew his V to the championship and loaned it to Mike for his flight, also. Sibling rivalry only goes so far in Kansas!

SLNT (Soaring League of North Texas) was well represented with a number of pilots. Henry Bostick and Jay Schulz placed in both events and made the fly-off. Pat McCleave and the KSSOAR crowd kept after them in 2 meter, prompting Henry's comment (upon placing 2nd), "Pat, friends don't let friends fly 2-meter!"

Hand Launch

14 folks came for Friday afternoon's hand launch with Jim Lawler from St. Louis attending just for this event. A number of different ships were in attendance, with the Climax, Orbiter and Monarch being the most popular. Most flights were 30-45 seconds due to the wind, but a good number of 2-3 minute flights were found. After 6 rounds with only one serious crash, Jim emerged on top. Awards were made through 3rd place. Top 5 of 14 pilots flying:

Jim Lawler	1272	Climax
Jeff Naber	1119	Orbiter
Tim Bennett	1074	Monarch - Skeeter
Pat McCleave	1024	Epsilon (Poly/Flap)
Ted Williams	1005	Monarch 94+

Unlimited

Unlimited was scheduled for 6 rounds of 4 flight groups each. Each group flew open winch on any of the available winches. Round 1 was a 4 minute target time. Although the wind was ~ 20 mph, a rather impressive shear wave just to the right of the launch area kept things going. With most folks making time (but not many landings!), rounds 2-4 went for 6 minutes followed by an 8 and then back to 6.

Landings and pop-offs were the key to this event. No pop-offs were allowed for experts; sportsmen were allowed one per round. However, with so many blown landings, a pop-off with decent time and a good landing would keep you in the hunt.

The Frickey brothers (Kansas) were in separate flight groups and consistently placed near the top of each round. Henry Bostick and Dale Nutter beat each other up pretty good in group 1 while Pat McCleave and Jay Schultz went at it in group 4. Going into round 6, the win was still up to any of about 6 pilots.

At this point it really got serious. All the big ships (Super-V, Laser 3MC, Falcon, Victory-C, etc.) have outstanding performance potential and you needed it all with this bunch. Henry, Mike and D.O. came out high in each of their groups, but Dan Meckler flying his first major contest in Sportsman class topped out group 4 with his Spirit 100!

When it was all settled, D.O. Darnell took the day with a well deserved win. Actually, D.O. wrote the scoring program for the contest. Say, you don't think???? Naaaah.



Mickey Sullivan ROGs his semi-scale 1-26.



Todd Degner, Terry Bryant, Tom Tapp, "Wow! Look at Jeff rip the wings off that one!"

Top 10 of 32 pilots flying

D.O. Darnell	5658	Super-V
Jay Schulz	5581	Falcon 880
Dave Register	5559	Laser 3MC
Phil Bullinger	5409	Victory-C
Pat McCleave	5273	Laser 2M
Mike Frickey	5167	Super-V
Jim Frickey	5128	Super-V
Henry Bostick	5011	Falcon 880
Stephen Rohmann	5005	Super-V
Joe Naber (Sportsman)	4964	Sapphire

2-Meter

After good lift in windy weather on Saturday, Sunday brought even better lift in calmer weather, but with thermals hopping all over the field to make it more challenging!

CD Jeff started with a 6 minute round which was maxed by just about everyone, forcing us to go to an 8 minute and then 2 ten minute rounds.

Lift started cycling pretty hard in the 2nd round, but thermal locations became predictable. The light wind from the north was easily shifted when lift cycled through. Many conversations on the field were something like, "...Breeze just shifted to the west. Thermal has got to be on your right..." And, just like that, it would be there. Really neat. Dave Thornburg would be proud!

As with unlimited, while the top pilots were hammering each other for 4 rounds, Jeff Droll, flying sportsmen, just kept picking away in group 4 with his Spectrum 2M (converted to cruciform tail). Jeff consistently placed high in his group to land a 7th place finish.

Top 10 of 31 pilots flying

Jim Frickey	3964	Super-V
Henry Bostick	3963	Super-V
Mike Frickey	3929	Super-V
Ted Williams	3855	Super-V
Bill Maserang	3809	Banshee
Pat McCleave	3773	Laser 2M



Henry Bostick (SLNT) launching a Super-V 2m.



Jeff Naber (L) congratulates overall winner Jim Frickey (R).

Jeff Droll 3533 Spectrum Cruc. tail
 Jay Schulz 3521 Banshee
 Robert Taylor 3478 Spectrum-V tail
 Dale Nutter 3441 Super-V

Fly-Off

Normalized scores from Unlimited and 2-meter were added together to determine the top 5 pilots for a fly-off to win the overall trophy. Pilots were Henry Bostick and Jay Schulz from SLNT (Dallas), and Jim & Mike Frickey and Pat McCleave from KSSOAR (Wichita). Format was a 2 minute precision duration with L-4 (25 ft. circle landing). Timing was done by D.O. Darnell. Spectators seemed to really enjoy the 'mano y mano' nature of the fly-off. Each launch was accompanied by the click of about 20 stop watches. When the dust settled, Jim Frickey was on top by a bare 6 points. Top sportsman was determined by total points and was won by Jeff Droll.

The 17th Last Fling is already being planned for September, 1998. If you weren't here, we missed you. With the emergence of the KSSOAR club, Tom Tapp's work with NWASS in Arkansas and, it pains us to admit it, the excellent competition from the Texans in SLNT, the mid-west is developing a very competitive contest circuit. Check it out next time you're in our area. ■

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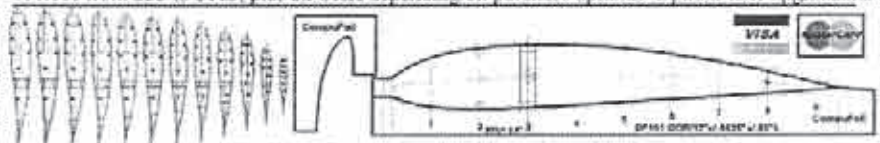
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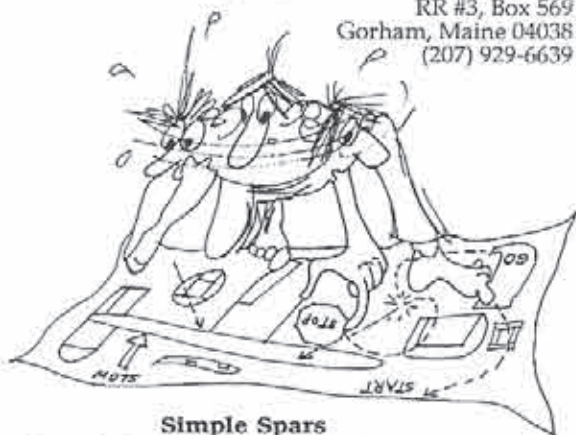
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Simple Spars

Several days ago, I was grounded at our local slope waiting for the incoming sea breeze to pick up. But while I was on the ground, several other fliers were beating up the slope with their 60" hand launch polys. Not owning a HLG, the next best thing was to finally rebuild the OLY II wings. The cores have been cut for 2 years; the tip panels were skinned with obeche and had the leading edges and tip blocks finish sanded last year. The only thing I had to do was build the spars, insert them in the cores, and add the skins and leading edges.

I wanted this to go quick, so I cut some medium weight 3/8" balsa plank into 1"

widths and cut them to length. I still had the original wing rod for the first set of wings, and I used it to match up some brass tubing to insert at a 4 degree angle into the balsa. The brass tubing was set into both spars at the same time, and epoxied in with a thick mixture of West and microballons. The tubing was then cut with a razor saw to separate the two spars.

To strengthen the balsa spars, I wrapped them in 4.7 oz. 80/20 hybrid carbon/glass cloth that was thoroughly wet out and scraped with a credit card to remove the excess resin. An additional piece of 9 oz. boat cloth was added to reinforce the first 8" of the root.

The wetting out was done on a piece of wax paper. The balsa spar was then laid on the cloth and the entire assembly placed on a piece of 1/8" by 1 1/4" angle aluminum that was pre-waxed. Doubled over paper towels served as a breather; the entire assembly was placed in a vacuum bag.

The excess air was removed from the bag and pleats were set in place to ensure that I had no rounded cavities to trap excess resin. I had also placed extra layers of paper towel at the ends of the spar to wick up the resin. The bag was then taken down to 22" of vacuum; I then used a heat gun to gently warm the assembly through the bag to get the resin very thin; in fact, the resin

would actually follow the heated zone, very similar to soldering. The last step was to place the assembly into an electric blanket and wait.

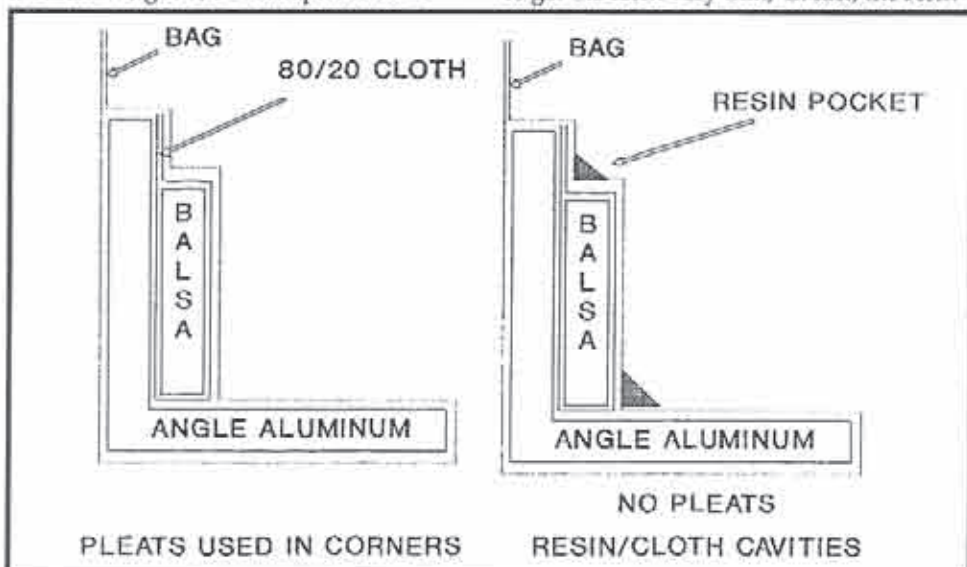
The spars easily separated from the angle due to the wax paper; the flashing was quickly removed via scissors and an 80 grit sanding bar. Each finished spar weighed 2 oz. and will far exceed the bending moment capability of the wing rod. The time taken to build these spars was under 2 hours, if curing time is not considered. I'm sure this same process could be used with different lay up and materials to get a stronger wing but, in this case, it wasn't needed, especially when one considers that the wing is held on by rubber bands. This new wing will not be as light as the original built-up wing, but it should hold a better airfoil (SD7055) and will take a bit more slope abuse. ■

Indoor Flying

By Lee Murray
Appleton, Wisconsin

The Valley Aero Modelers of north east Wisconsin get together during the building season for indoor flying in school gyms. My first participation in this season's indoor flying was Friday, October 24th. I had been on a short Florida vacation. In anticipation of possible bad weather, I packed my Midwest Right Flyer kit that I had since last season.

Bad weather greeted me the first day, and I wasted no time putting the kit together. I didn't cover or glue the wing halves together until I got home later that week. Friday night, my adult son, Jim, reminded me that this is the night for indoor flying — holding the Right Flyer in hand. We enthusiastically decided to go trim out the new model. She was looking great except for some baggy wings that I didn't know how to fix. The one attempt I made at shrinking the paper covering had ended up making the wings bow up like a Hobbie Hawk. Borrowing some rubber lube from Ted Elliott, I lubed the rubber, tied a knot to join the ends of the loop and installed the rubber motor. Things looked reasonably good, so I decided to let Jim trim her out. The model flew as though it was my first model ever. Nothing seemed to work. Russ Wlitschak commented, "I didn't think it was possible to make one which wouldn't fly." Tom Rogers' and Ted Elliott's Right Flyers cruise smoothly around the gym, while mine can only orient itself vertically... First up, then down. I finally decided to take a crack at finding the right combinations of CG, trim settings, motor wind, launch angle, etc. The model was doing tail slides, inverted landings, and stall turns. Jim sarcastically remarked, "Pilots train for years to do that, Dad. You have accomplished it with design." What am I to do? After years of effort generating some degree of accomplishment in RC soaring, I come up as a rank amateur in indoor free flight. It looks as if there is yet another skill to master. ■



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WING LOADING	9.7 - 10.3 OZ./SQ. FT.

The Condor is designed by Mark Allen, who is considered one of the best model sailplane designers in the United States, if not the world. Mark has taken all of his previous experience in competition thermal duration flying, plus all the knowledge he has gained from his earlier contest and sport designs, to design the Condor. Mark Allen's previous planes, to name only a few, are: Falcon 880 and 800, Falcon 600, Swift, Thermal Eagle, Vulcan, Night Hawk, Sky Hawk, Electric Hawk, Falcon 550E, Rocket, Pocket Rocket and, of course, the molded, world championship F3B Eagle. By taking the best of these designs and the new construction techniques available today, Mark has come up with what we feel, is the absolute best open-class sailplane available.

The wings are made in America by Ron Vann, owner of Spectrum Enterprises. Ron is also an avid competition flier, and is considered to be one of the best wing manufacturers in the industry. Taking his years of experience in manufacturing wings, Ron has produced wings and stabs for the Condor that we feel are world class. Starting with the spar that Mark Allen designed, Ron uses only the best and most accurately cut foam cores available. He then uses hand-picked obechi from Kennedy Composites, which is applied with West Systems epoxy.

CONDOR

*Tomorrow's Sailplane,
Technology Today*

This is after he has first reinforced the wing with carbon fiber and fiberglass. The servo wells are routed out, as are the flaps and ailerons. What this means for the sailplane enthusiast is a minimum amount of work before getting the sailplane into the air. The wing is light but strong enough to take "pedal to the metal" launches. Also available as an option is Ron's unique internal capped hinge line. This means even less work for the modeler.

The fuselage is made by Steve Hug, owner of the Fuse Works. Steve is another master at what he does. Fuse Works makes what we consider to be the best fuselage in the business. Steve uses only the best fiberglass and Kevlar™ available. All fuselages are manufactured using the West Systems epoxy. Steve's fuselages have the least amount of pinholes, if any, that we have seen. In fact, the fuselage is so pretty that many people do not paint it. The fuselage is extremely light, and yet strong enough for very aggressive flying and landing. For those with very little

building time, and those who don't like to paint, there is an optional pre-painted, in the mold, fuselage which includes a unique carbon fiber canopy.

All kitting is done at Slegers International's new and larger manufacturing facilities. We have spared no time or expense with supplying the modeler with the best materials available. The kit contains pre-sheathed wings and stabs by Ron Vann, fiberglass and Kevlar™ reinforced fuselage by Steve Hug, 3/8" diameter titanium wing rod from Kennedy Composites, optional 3/8" diameter steel wing rod by Squires Model Products, control horns and tow hook by Ziegelmeyer Enterprises, pushrods by Sullivan, or optional one piece steel rods. All wood is custom cut. Specially cut basswood of 60" is supplied to eliminate splices in leading edge, flaps and aileron capping. All balsa is hand picked, light to medium, to ensure light weight wing tips, stab tips, and rudder. Aircraft ply is used for the pre-fit servo tray and towhook block. A comprehensive instruction manual is included.

The Condor, designed by Mark Allen, wings by Ron Vann, fuselage by Steve Hug, and kitted by Slegers International, we feel, is the best open-class, thermal duration sailplane available, at an affordable price of \$395.00 plus S&H.

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The Third Annual Joe Wurts RCHLG Cup Fly

By Paul Clark
Osaka Fu, Japan



For the third year in a row the sun shined on what has become the premier RCHLG event in Japan. Happening in Tokyo, it is the nearest thing to a nationals for the class. December 7th, 1996 was the Third Annual Joe Wurts RCHLG Cup Fly sponsored by the Takatsuki Openfield Flyers or TDKH (Takatsuki Denpata Kaku Han), headed up by Nobusuke "Buzz" Tokunaga. It is one of six contests arranged by an ad hoc committee for RCHLG in the Tokyo area and held at the Showa Kinen Kokuritsu Koen National Park grounds, formerly a part of Tachikawa Air Force Base; the other contests are sponsored by Sanwa. Joe Wurts, Gordon Jennings and Sky Pilot Paul Clark made the first one a real international event.

The First JW RCHLG Cup Fly set off a RCHLG boom in Japan that created what was called hand launch mania. Kit makers from the States, Europe and newbies here in Japan continue to enjoy a volume of slow but steady sales. Buzz himself makes his Boomerang available on a limited basis and remains the distributor for DJ Aerotech products in Japan, whose Don Stackhouse gave Buzz a lot of help in getting that first contest off the ground.

The Joe Wurts designation is more than an acknowledgment of Joe's presence at the first contest. A video of Joe flying XC, which included a clip of RCHLG flying, was the initial inspiration for Buzz and the TDKH guys. When Joe came to Japan, Buzz went to see him. His flying and comments on RCHLG influenced, not only Buzz, but a number of the best RC soaring and power pilots in Japan. These and others who had already been doing RCHLG over the years would make the first national contest a real success. After this year's event, Buzz remarked with a big smile, "It's going to make it!" And, it has!

The Third Annual was the first RCHLG contest that really had the resemblance of what would be considered today a good contest format. Further, it showed the influence of Buzz' recent summer of '96 appearances at the Torrey Pine Gulls International Hand Launch Glider Festival and the Mid-South Soaring Championships. The contest had three rounds followed by a fly-off for the top ten contestants; the first round scored the number of flights in successive sequence, beginning from 15 seconds and adding 5 seconds to each with a 10 minute window; as time was flying, the second round window was reduced to 7 minutes, the 3



Buzz, Japan's champ, hand catching his Boomerang.



Shinichi Nakamura and his HL-1 Compe.



Typical effort in a scratch design & build.

longest flights counting with 2 minute maxes; round three counted total flight time in a 10 minute window, with a 10 second penalty for each launch after the first one; the fly-off round consisted of the longest flight time in the 10 minute window.

Japan has more RC channels available now than before, so the rounds were flown with 8 to 10 pilots. Buzz won the contest, but there were many worthy competitors in the field; in fact, Buzz was bested in the final round, 4 seconds, by a highly competitive pilot, but won with a good lead. There were 42 competitors from all over Japan.

RCHLG building is a natural for the Japanese enthusiast and many of the birds that showed up at the contest were works of art. There is a lot of experimenting going on; polyhedral wings yet predominate, but not necessarily winning; pod and boom fuselages are popular and there were a lot of winglets to be seen at the contest. Light is also in and some amazingly light builds were flying with full RCHLG wing areas. Probably half of the models were "jisaku" or builder designs. While several Japanese kits are available now, only Shuhei Okamoto's HL-1 Compe and Techno are really in the contest class aside from the Boomerang, which Buzz flew to his win; Shinichi Saitoh placed 2nd with his HL-1 Techno and Shinichi Nakamura's was third with a HL-1 Compe.

Come join us for the Fourth Annual Joe Wurts RCHLG Cup Fly, December 6, 1997!



The "real" bird; it does thermal, but...



This tail build emphasizes the art work in these models.

Modifying a Kit Model for Nylon Wing Mounting Bolts

...by Oliver Wilson
Punta Gorda, Florida

In the previous article, I discussed the pros and cons of wing mounting and made specific recommendations about screw size, spacing and maintenance. In this article I describe modifications to kits, replacing rubberbands and dowels with nylon screws.

If the model is already built, then the easiest method is to use filled epoxy for the wing bolt slugs in the wing center section and for a combination wing saddle and double nut. The materials required are:

- Low viscosity epoxy (PJ's, Easy Lam, or West System)
- Filler (West System high density, chopped glass, powdered graphite or flox)
- Plastic film (kitchen wrap)
- Gloves
- Paper cups and stirring sticks
- Hobby knife
- Plastic syringe (available from Gast, Aerospace Composite Products, or Composite Structures Technology)
- 3/32 thick birch Plywood
- Masking tape
- Drill and tap set (see original article for sizes)

Begin by cutting two 1/4 inch diameter holes for syringe access near the wing root. If it is a two piece wing like the Olympic II, cut the holes in the root ribs about 1-3/8 inches in front of the main spar. If the center section is one piece like the Paragon, cut the holes in the bottom sheeting one inch in front of the spar and one inch either side of the center rib. Prop the wing up so the bottom surface is vertical and the trailing edge is at about 45 degrees to the horizontal. This will allow the filled epoxy to form a triangular puddle between the front of the spar and the root (center) rib. Put on the gloves. Mix about an ounce of epoxy according to the directions on the container and stir in filler until the mixture reaches the consistency of sour cream. Cut off all but 1/4 inch of the plastic tip of the syringe. Load the syringe with the filled epoxy and inject the mixture into the wing through the 1/4 inch hole until the mixture is up to the hole. Fill only the uppermost hole at this time. Wipe off any excess. Allow the epoxy mixture to set before moving the wing.

When the epoxy has set, reposition the wing and repeat for the other side.

Put the two halves of the wing together with their joiners. Cover at least six inches of the bottom center section of the wing with plastic kitchen wrap and pull it smooth with small pieces of masking tape around the edges. Fold it around the leading and trailing edges so they too will be protected. This film will act as a parting agent while molding the wing saddle. Cut

a former from the 3/32 birch plywood to fit horizontally inside the fuselage and about 3/8 to 3/4 inches below the wing saddle (depending on the size of the model). This plywood former must extend fore and aft of the slugs of filled epoxy in the wing (when the wing is mounted to the fuselage). Glue the former into the fuselage. When the glue has set, don your gloves and mix up a batch of epoxy. Stir filler into the epoxy until the mixture reaches a peanut butter like consistency. Spread a little epoxy mixture all over the wing seat on the fuselage and put enough on the 3/32 ply former to reach from one side of the fuselage to the other, and 1/2 inch fore and aft of where you are going to drill for the wing bolts. Pile the former with filled epoxy until the mixture is a little above the wing saddle. Align the film-protected wing center section over the wing saddle and press it into the epoxy mixture. Adjust the position of the wing on the fuselage until it is aligned in every direction. Weight or rubberband the wing in position until the epoxy sets.

When the epoxy has set firm, but is still "green", remove the weights or rubber bands and peel off the masking tape from the wing. Remove the wing from the fuselage. Peel off the parting film from the wing saddle. Cut away any excess epoxy mixture that has oozed out. When the epoxy has cured hard (second day), align the wing over the fuselage and rubberband it in place. Double check the alignment. Using the proper drill size for the tap, drill (2) through the epoxy slugs in the wing

into the epoxy block in the fuselage. Countersink the holes in the top of the wing for flush screws, and enlarge the holes through the wing, so the nylon bolts will just slide through without excessive play. Tap the holes in the fuselage. Run the tap in and out several times and check the fit of the nylon screws. They should turn freely with the fingers. If necessary, lubricate the screws with a dry teflon spray.

Cut off any dowels that protrude from the fuselage and repair the covering. For center rubberbands, as in the Gentle Lady or Paragon, close the hole in the fuselage behind the wing. Mount the wing with the nylon screws and snug them up. Check the wing by rotating it on the saddle. It should give several inches at the tip before the nylon bolts shear. It should also ease back into position as it is realigned. There should be a definite detent feel as it is properly positioned.

That's it. Go fly with confidence. You have improved the L/D by about two percent and the wind penetration glide slope by about four to eight percent. Better yet, the wing won't lift off the saddle during launch (as happened to a flying buddy in a Labor Day contest).

If you have any comments or questions you can reach me at 941-627-2117, ocwilson@sunline.net, or 1987 Nuremberg Blvd., Punta Gorda, FL 33983. Better yet, come to FSS NO. 1 (Florida Soaring Society) January 10 and 11, 1997 in Punta Gorda and we can talk at length.

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Winches, Timers and Tapes (Oh My!)

by Ron Weaver

Buffalo Grove, Illinois
72647,1276@Compuserve.com

You arrive at your first real contest, and one thing quickly becomes apparent: you're sure not in Kansas anymore! This is more like the land of Oz. An emerald-green city of tents and tarps has sprung from the field, and sailplanes fill the air like so many flying monkeys.

We should not fear the whirlwind of competition that plucks us from our comfy homes and plops us down in this strange land. We are placed on the yellow brick road of self-knowledge and self-improvement. Yeah, right. Anyway, here are some contest insights that may reveal the man behind the curtain to be less imposing than he seems, since many glider pilots seem reluctant to make this journey to Oz. I think the percentage that do is probably very close to the percentage of people in the general population with masochistic tendencies. The majority prefer to experience the solitude and joy of flight, and frequently leave a flying session with feelings of tranquillity and peace. The contest experience *can* be quite different.

Preparation for a contest really starts months in advance. You'll need to learn to solo first. That done, you're ready to hit the contest trail. Practice helps, but not that much your first time out. You'll be so overwhelmed that your flying skill will shockingly revert to rank beginner no matter how well prepared you think you are. You'll feel like the Scarecrow character - moments of lucidity can be coaxed from your being, but for the most part they won't be.

On arrival at the field, the first thing you need to do is assemble your aircraft. Even if you don't tape your wings on at your home field, you had best do it here. The drag reduction could be the difference between landing out, and landing not so far out. As for me, I use the tape to try to hide the substantial gap between my wing root and the fuselage. Unfortunately, I purchased quite a few rolls of tape in a bulk deal a few years back, and they're all transparent, so the illusion is less than complete. Hopefully, in your efforts to remember everything you'll possibly need at the contest, you remembered the few items that you really *do* need, like your wing rod and your stabs. If you did, give yourself a pat on the back for having a lucid moment or two.

When the pilot's meeting is called, the city of tents will become eerily deserted. You'll attend the meeting, if for no other reason than you can't stand that Omega Man feeling. No matter how many of these you attend (and they're all strikingly similar), it's better than feeling like the lone survivor of a nuclear holocaust. Topics discussed at the pilot's meeting will include field boundaries (just in case you can't tell where the edges of the field are), pop-offs (this, by the way, is *not* a sexual dysfunction), and no-fly zones. A little common sense covers a lot of ground here. What it comes down to is this: after you launch,

don't fly where you're likely to hit something you shouldn't, and land somewhere on the field. These are deceptively simple concepts.

Also discussed at the meeting will be the task. Now to me, a task doesn't sound like something you'd do for fun. It sounds a little like a chore. In fact, at contests, the task is designed to take most of the real fun out of flying. If you're in good air, the kind of air that has your plane orbiting the moon, the task will seem all too short. That means you don't really get to enjoy this great thermal you just hooked. If you've got a longer task (or bad air), you'll be sweating to make your time. Either way, you're almost certain to derive little pleasure from the task since it's set up contrary to the way we fly for fun: in good air, you must abort, and in bad air, you must persist.

When you're called to fly, try to be cool. You might have the jitters, but to a certain extent, it's the adrenaline that we all crave. I've seen pilots with many, many years of experience whose hands shake like crazy while they're flying. You would think this would somehow be reflected in the flight of the model, but these experienced guys fly smoother than anyone else. They must have learned over the years to compensate for the shaking. These are the real hardcore adrenaline junkies - the old guys.

Your first real test will be the launch. Be forewarned that serious competitors like to have strong winches. Many a plane has surrendered its wings to a strong winch and an inexperienced pedal-foot powered by adrenaline. If you don't actually break your wings, you'll at least elicit some oohs and aaahs from the crowd as your wings bend further than they should rightfully be able to. When you get that kind of response from this crowd, you know something really remarkable has just happened. Don't spend any time thinking about it. Time spent thinking about other things will surely be deducted from your flight time.

You've probably launched into one of 2 kinds of air. Great air, or really bad air. To help you visualize a thermal, you can think of a mushroom growing on a cow flop. It takes a lot of cow flop to support the growth of a single mushroom (unless they're really small), so the laws of probability are working against you, and you've probably launched into the part of the cow flop that doesn't have any mushrooms on it. This isn't all bad, since those mushrooms can play havoc with your flying surfaces when you try to zoom launch through them. In any event, the air is almost never as good as you'd like it to be.

If you've got a good timer he can be a great help and he may be able to spot some lift for you. Since your timer can actually help, if behooves you to ask someone that knows what they're doing. My buddy Tom tells a great story about the time he managed to end up with a mute timer. The timer would tap Tom on the shoulder and then hold up some combination of fingers that indicated the time remaining. Needless to say, this can be somewhat distracting. You want to be able to hear your



timer, but you don't want to hear certain things. Here's my list of the top ten things I don't want to hear my timer say:

- 10 I'll be right back, I have to take a whiz.
- 9 That cool breeze sure feels good.
- 8 I just bet the CD \$10 that you wouldn't make your time.
- 7 What's that switch there do? And that one? How about that knob?
- 6 Oooh, man, you just stepped in a cow flop/gopher hole.
- 5 That guy over there has some great air, but you can't get there.
- 4 Hmm... Looks like the watch didn't start...
- 3 Did something just fall off your plane?
- 2 My buddy's kicking your butt.
- 1 I'm kicking your butt.

You'd also rather not hear a bunch of erratic, stray beeps coming from his or her watch - and the less fiddling with the watch and the buttons on it, the better.

At some point during the flight, you're ready to set up for your landing. Okay, maybe you're not quite ready, but ready or not, you're going to land. The landing can be the most exciting part of the whole flight. Mentally, this is the hardest and most crucial part of the flight. Do whatever you need to do to help you focus on the task at hand. Try to forget that a fairly large percentage of your score for the round will be determined by a distance of a few inches. Don't think about all of the great pilots that are watching you. Don't dwell on the last landing that you botched. Ignore the notion that your expensive plane may be rendered worthless if you hit too hard. Don't give a moment's thought to the possibility that you might come in too hot, overshoot the landing, and create mayhem among the innocent bystanders, possibly injuring one of them with your rogue composite missile. Once you've put those things out of your mind, you can focus on how darned small that landing area looks. You see? It's all mental.

Congratulations! You've just completed a contest flight. If your plane is in one piece, give yourself another pat on the back. If it's in fewer than 4 pieces (not the ones that are supposed to come off), start trying to borrow some 5 minute epoxy from someone. Try one of those guys with the workshop on wheels, or someone with a really big toolbox. Remember, like Dorothy, you have the power to return home at any time; but, unlike Dorothy, you may not want to, because you're having such a good time with a bunch of great people... And that's the *real* reason many of us fly contests. ■

"Fighting the Gremlins"

...by William G. Swingle II
Pleasanton, California
bill_swingle@electro-test.com

I had a new tow hook location to try. The weather was good for hi-starting. No wind for sloping. And most importantly, I had the time to go fly. Then, things fell apart. My hi-starting pal, the guy whose hi-start I borrow, had gone out of town for a vacation.

It's not that I was too cheap to buy my own hi-start (though I am astoundingly cheap). It's just that I'm new to this hi-starting thing. I had only done it twice and had only just gotten the bug. Drat. I kind of had my hopes up. Then, the symptoms hit. I had no idea the hi-starting withdrawals would be similar to the sloping 'drawls! It was only 2:00 p.m., and I had my heart set on flying that afternoon. There was no way I could sit idly by while a perfectly good afternoon went to waste. I began searching the town for any stretchy tubing material that I could lay my hands on.

I began combing the local hardware stores. One side benefit is that I love hardware stores (Doesn't everybody?). I started with the hardware and lumber store at my end of town. No stretchable tubing. But I did see a nice twelve inch spike for \$0.39, so the trip wasn't for nothing. Then, I went to the nearest automotive parts store. They did have some rubber tubing that was just about the right size. However, I could tell that it was made of plastic and had almost no elastic properties. Drat... I continued my search.

Next was the main street hardware store. Great place. It's an old style hardware store with wood floors and wood shelves. Very nostalgic. It always reminds me of my home town. It's the kind of place where you can buy a variable speed, cordless drill or a toaster. I can browse the electrical aisle happily for an hour. Recently, Ace Hardware company brought their spokesman, John Madden, here to film one of their

commercials.

I first browsed the bungee section, but found nothing really useful. Then, I remembered something my father had purchased in our hometown hardware store. It was half inch diameter rubber cord that could be purchased in any length. Sort of a make your own bungee! I remembered it was very durable and strong.

So, remembering my father's old bungee, I asked a salesman. He led me straight to a roll of latex tubing! 1/4 inch inside diameter, 7/16 inch outside diameter, it was almost perfect. Then, I noticed the price was \$1.14 a foot! Good thing those little price stickers are so small. It makes them easy to ignore, which is exactly what I did. I bought ten feet, grabbed a roll of 180 lb. test string, a reel for storage, and I was done.

I rushed home and rigged it all up with the spike I'd purchased at the first hardware store. I used the method mentioned in the December issue of RCSD, which used an eye bolt threaded into a wooden dowel. It was easy, worked well and looked professional, too. It was 4 o'clock. I was ready to fly with a whole hour of daylight left!

I jumped my backyard fence (no gate) and staked out my new creation in the small little park behind my house. The park is far too small for even an upstart. I think ideal would be twenty feet of latex and sixty feet of line, but my little "jump" start worked well. I got a bunch of landing practice and successfully fought away those nasty, flying withdrawal gremlins.

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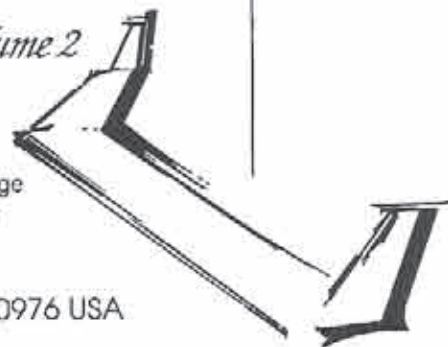
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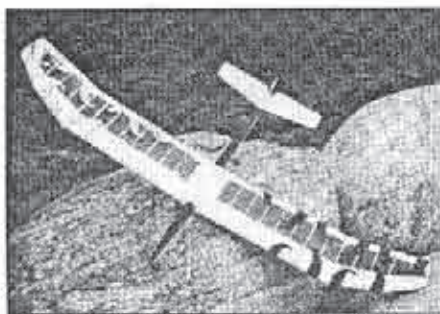
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Avocet Vertech Pilot Wristwatch

By Gary Fogel
Los Angeles, California

Full scale sailplane pilots have it easy. A quick glance at the instrument panel offers a wealth of knowledge about the performance of the plane. In contrast, most R/C sailplane pilots fly by "the seat of their pants", or more properly, "the soles of their feet", when it comes to measuring rate of climb or altitude, and so forth. We are forced to infer rate of climb or altitude in terms of changes in the model's size and attitude. How can we determine the maximum rate of climb or maximum altitude during that great thermal flight? One method to easily answer these questions is to use the Vertech Pilot wristwatch offered by Avocet, Inc.

The Vertech Pilot offers a wide range of functions in a very small package. It can be used by ultralight pilots and R/C enthusiasts using four different "function" operations: Altitude, Pilot, Weather, and Timing. Each of these functions has multiple watch displays (see Table 1). Obviously, without radio telemetry emanating from the R/C model, the R/C pilot is forced to inquire about flight performance upon landing. It is useful, then, to have an instrument that stores information about the flight, rather than providing only "real-time" measurements. The Vertech Pilot watch has the ability to store maximum altitude, total vertical feet accumulated, maximum ascent or descent rate, number of thermals flown, and trend in barometric pressure. All of this in a package that weighs 0.9 ounces without the wristband and is 1.6 inches wide x 2.05 inches high x 0.6 inches thick. This watch can be easily mounted with double-sided tape on the inside of most R/C models, and even on top of smaller hand-launch gliders.

How does the altimeter work? By measuring differences in air pressure as recorded by the barometer, the Vertech Pilot displays changes in altitude above sea level. Daily fluctuations in barometric pressure will have a slight effect on the accuracy of the altimeter; however, Avocet, Inc. suggests that over a typical day the altitude displayed may vary from the actual altitude by as little as 50 feet. Both the barometer and altitude can be easily reset between flights, provided that the user has an accurate external measure of air pressure (a local airport, weather broadcast, etc.) and knows the correct altitude of the launching point. For R/C pilots who also enjoy skiing, the Vertech Pilot can double as a Ski/Alpine watch. Instead of rate of ascent or descent read in feet per minute, the Ski option reads feet per hour. And instead of counting the number of thermals flown (a 150-foot climb and descent is counted as one thermal), the watch can be used to count the number of ski runs completed. All measurements can be given in either

Table 1. Listing of functions for the Avocet Vertech Pilot wristwatch. All of the information was found in the comprehensive instruction manual provided with the watch and was slightly modified to form this table. Comments include those of the manufacturer and the reviewer.

Function	Watch Display	Comments
Altitude	Current Altitude	-4000 ft. to +40,000 ft. in 10 ft. increments. ± 50 ft. depending on barometric drift. See barometric trend under Weather function below. Not very useful for R/C model applications but nice for everyday use or for use in ultralight aircraft.
	Maximum Altitude	-4000 ft. to +40,000 ft. in 10 ft. increments. ± 50 ft. depending on barometric drift. See barometric trend under Weather function below. Much more useful for R/C aircraft applications.
	Countdown Timer	Maximum to 23:59:00. Also see Timing function below. Useful for R/C sailplane contests and timing duration of flight.
	Date	Self Explanatory.
	Alarm	Self Explanatory.
Pilot	Daily Vertical Feet	To 299,990 ft. in 10 ft. increments, can be reset or accumulate between flights.
	Total Vertical Feet	To 299,990 ft. in 10 ft. increments, can be reset or accumulate between flights. Useful for both R/C and ultralight aircraft.
	Current Ascent/Descent Rate	0 ft./min. to 7,600 ft./min. in 50 ft./min. increments. Not useful for R/C, but very useful for ultralight aircraft.
	Maximum Ascent/Descent Rate	0 ft./min. to 7,600 ft./min. in 50 ft./min. increments, resettable. Interesting to note what that strong thermal really gave you as a climb rate.
	Average Ascent/Descent Rate	0 ft./min. to 7,600 ft./min. in 50 ft./min. increments over a fixed period of 18 hrs., resettable.
	Number of Thermals Flown	To 199 then stops. Counter is tripped by a 150 ft. ascent followed by a 150 ft. descent. Watch can also be converted to "Alpine" mode to give ft./hr. and number of ski runs instead of thermals. Can sometimes be misleading for very small thermals used by R/C models, but generally 150 ft. is an adequate thermal marker.
Weather	Sea Level Barometer	28.84 inches to 31.00 inches of mercury with 0.01 resolution. Internal barometer may drift slightly after 1-2 years. Can easily be readjusted by owner. Barometer can be read as inches of mercury or millibars.
	Barometric Trend	-9.99 to +9.99 inches of mercury with 0.01 resolution. Useful to predict daily soaring conditions.
	Temperature	0°F to +122°F in 1° increments. Accuracy $\pm 4^\circ\text{F}$ above 32°F, $+4^\circ$ for each 10° below 32°F. Temperature can be read in Fahrenheit or Celsius. Temperature also displayed in Altitude function.
Timing	Stopwatch splits and laps	Resolution 0.05 second to 59:59:95, 1.0 second from 1:00:00 to 23:59:59.
	Split or lap group memory	Stores up to 20 split or lap groups.

VERTECH PILOT WITH SKI / ALPIN OPTION



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- Barometer with resettable trend and thermometer
- Ski option with downhill descent rate and number of runs
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- Includes all popular wristwatch functions
- Split/lap timer with memory and recall
- Made in California's Silicon Valley

AVOCET

English or metric units.

Without question, the Avocet Pilot watch represents one of the most affordable and comprehensive instrumentation packages possible for R/C sailplanes without using telemetry. The list price for the watch is \$125, and it is available at many camping/hiking outlets. The watch can also be ordered from Avocet, Inc. at: 8674 Thornton Ave., Newark, CA 94560. To obtain product information, call 1-800-227-8346 (Monday through Friday, 8 am-5 pm, Pacific Standard Time), or use the internet at "http://www.avocet.com/Central.htm".

Some Look...

By William G. Swingle II
Pleasanton, California
bill_swingle@electro-test.com

I have been mystified about something for a long time now. Why is it that some passer-by's won't even glance at a flying model? I'm stumped.

My home slope has a road right on the top. The road is only about ten feet from the edge of the slope, and remains there for the entire length of the ridge. Because of the ever present cars driving by, getting caught in the rotor just behind the edge can be a hair raising experience.

For years I've watched drivers as they pass the slope. I always notice their gaze. Sometimes they appear interested. Occasionally, they'll stop and watch. This is what happened when I was trying to hand catch my DAW Foam 51, and flew

it squarely into my right eye. Thanks goodness for quality eye protection! But I digress. Amazingly though, most of the time, those passing by never even glance at the flying models!

We'll occasionally match the speed of a passing car and position our planes at eye level and roughly ten feet from their window. This is fun in its own right, but has also shown something else. Those that don't look are very consistent. Apparently their world doesn't know anything about airplanes, so they just don't notice the magical, gravity defying machine. I've mentioned this to several other pilots. Most didn't have a specific answer, but recently I heard one that I found shocking. A fellow pilot simply said, "They're not interested."

No way; it couldn't be! Inconceivable. My search for the truth continues. ■

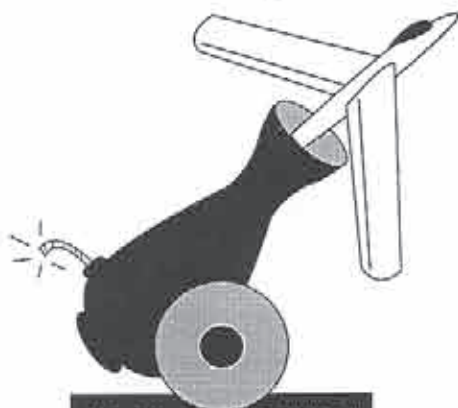
The rare double. Daryl Perkins won both the 1997 Torrey Pines International Hand Launch Festival and the AMA/LSF Nationals flying box-stock Maple Leafs. Think about this: Daryl can fly any Leafs. Just in case you might think about this: neighborhood toss field. Like he says, right to fly and



Nationals flying box-stock Maple Leafs. plane he wants, and he chose Maple Leafs. Just in case you might be thinking that Maple Leafs are cranky, Daryl lets the kids in his neighborhood toss field. Like he says, right to fly and

fragile contest planes, Daryl lets the kids in his his around the local "No airplane has the handle this well."

510.254.2500 or mapleleaf@aol.com
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"BOOM, YOU'RE SKIED!" ZIKA

Correction

There was an error in the October issue of RCSD, article titled "Analysis of Flight Performance" by Lee Murray. We got in too much of a hurry and used the symbol '<' to indicate greater than, when we should have used '>' in charts 1, 2, and the right side of chart 3. Our apologies!

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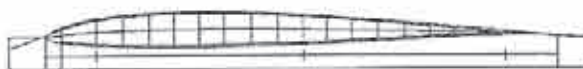
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Gallery of Gliders

Specs	ASW-1924	PILATUS B-4	LUNAK LF-107	DISCUS (1:3.5)	DG 600 (1:4.5)	NIMBUS 4-D
Wing Span:	49 in./84 in.	57 in.	66 in.	163 in.	137/165 in.	130 in.
Length:	26.3 in./28.3 in.	29.5 in.	28 in.	74 in.	62.5 in.	48 in.
Wt.:	9 oz./11 oz. \$139.95/\$159.95	10.5 oz. \$149.95	15 oz. \$189.95	200 oz. \$1189.95	123 oz. \$899.95	54 oz. \$499.95

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How & Why to Build A Temperature Controlled

Hot Box

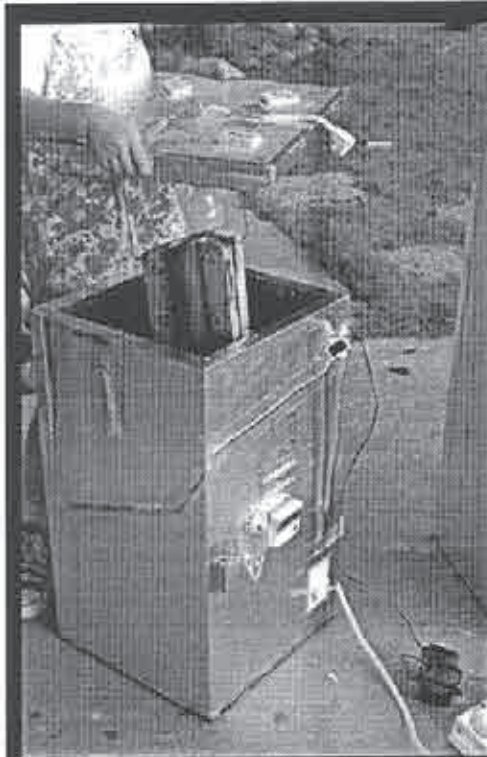
By Del Brengman
San Jose, California

In the process of vacuum bagging wings and working with epoxy, I have found that epoxy cures at room temperature in about 8 - 12 hours, to a point that appears hard, but will continue to cure for up to 2 weeks longer.

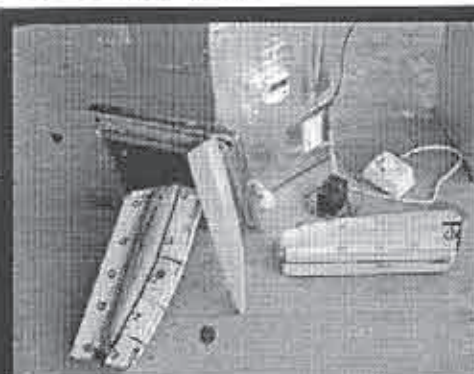
After an overnight cure, most of us get up early to see the results of our handiwork. We remove the wing from the bag and peel back the mylar. How nice it is when the finish looks like a mirror. Then, we go about other details of construction, only to find, some time later, that the finish that was once so smooth has started to look grainy. Touching the wing, we may get sticky little finger prints on it; and, we may ask ourselves, "Why?"

The mylar was the surface reference. Without it, the weave of the surface cloth comes to the surface. Because it is still curing, it is still sticky. Something not seen is the fact that it is not as strong as it could be, by as much as 60%.

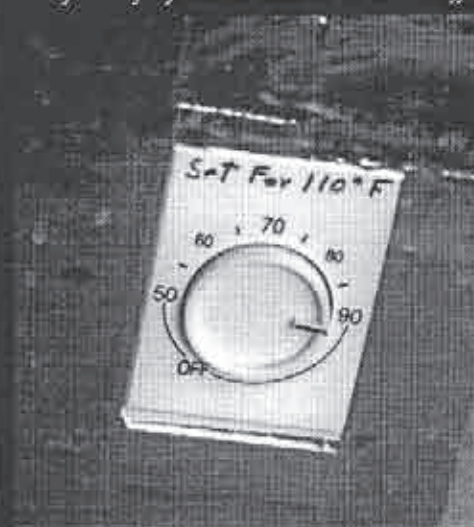
Most of the professionals in this hobby cure epoxy fuselages, wings, and other parts at elevated temperatures (90 - 100° F). For those of you interested in this subject, I recommend getting a copy of West Systems technical manual and product guide, cat. #002-950. I got mine at Monterey Bay Fiberglass, 1037 17th Ave., Santa Cruz, CA 95062; (408) 476-7464. Or, Gougeon Brothers, Inc., P.O. Box 908, Bay City, MI 48707-0908; (517) 684-7286, fax (517) 684-1374.



The short box with nose cone mold hanging from lid.



Nose cone from mold and second mold. Power transformer for fans and timer to turn it all off.



Temperature control.



The long box and fuselage plug for size comparisons.



On the workbench...



Hot box on pulleys above workbench.

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The box I built is 6 foot long, 2 feet wide, and 12 inches high. It is made of an insulation material that is probably polyurethane with aluminum foil on both sides, in a 4' x 8' sheet, 1" thick. I got mine at Home Depot. It's easy to cut with a straight edge and long blade xacto knife. After cutting, the box is assembled with aluminum foil tape. I taped all the seams inside and out, and all the edges, which gives it a nice metallic finish. The bottom edge is covered with a 1 inch wide weather strip.

I also placed mine in a pulley system; when not in use, up to the shop ceiling it goes.

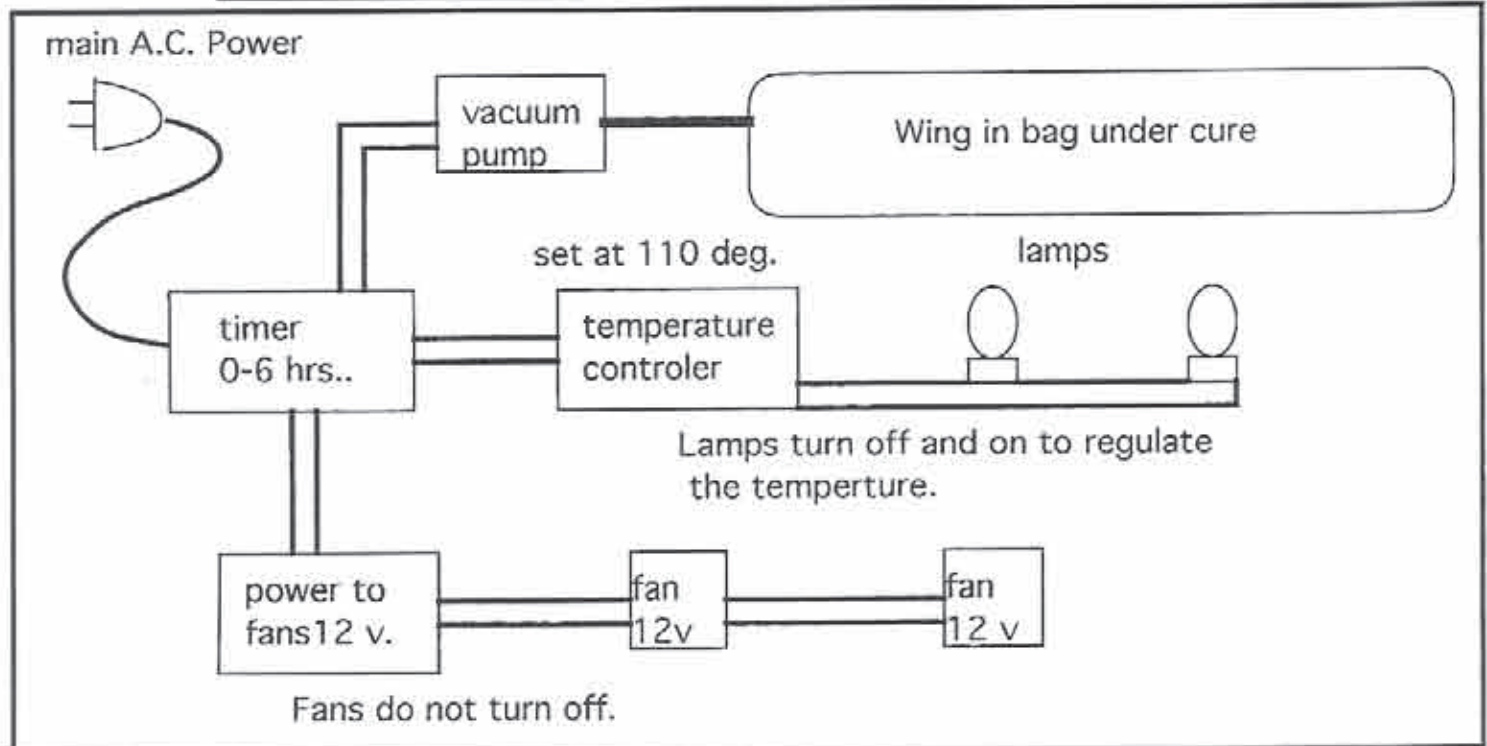
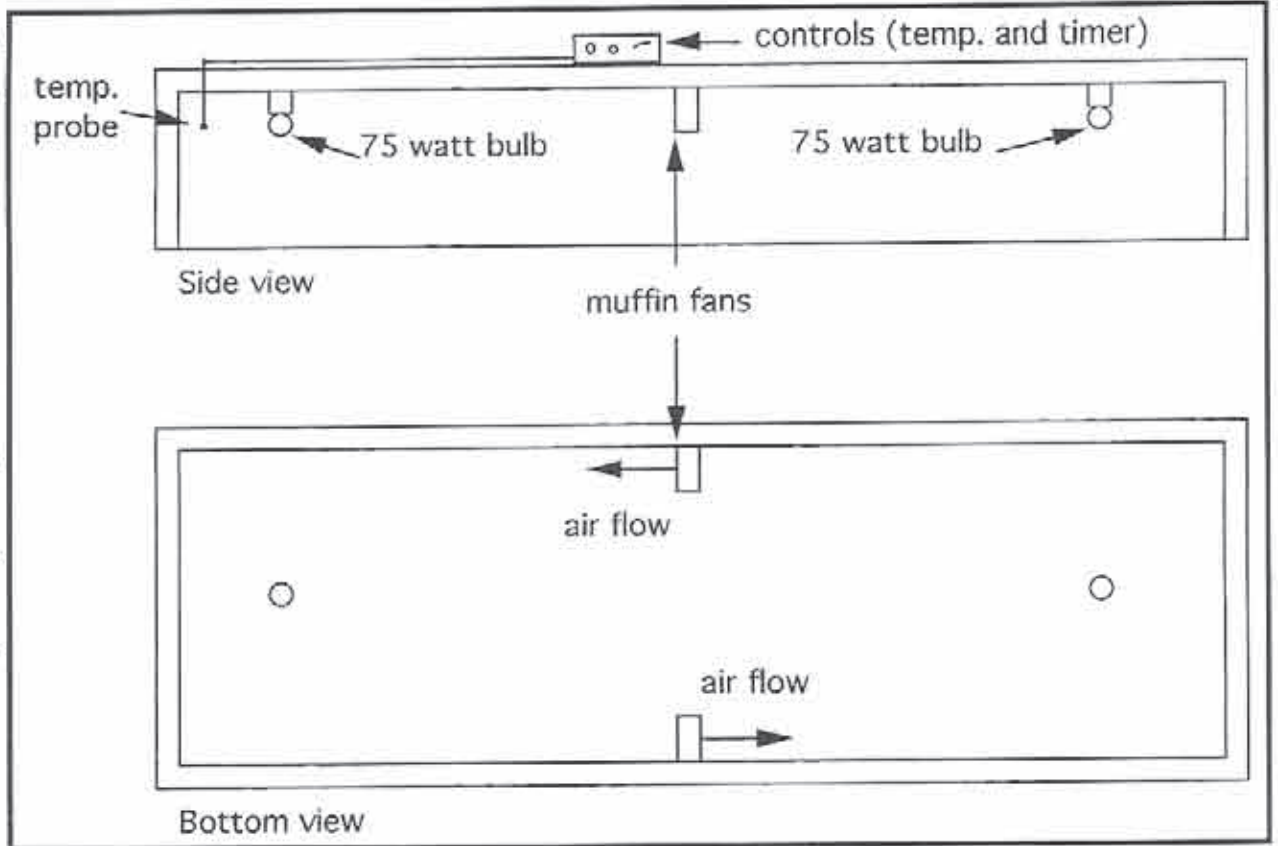
The heat source is two 75 watt light bulbs, and two small muffin fans obtained from a surplus store. A temperature controller turns lights and fans on and off at a set temperature, and can be obtained at either a hardware or surplus store. A timer turns everything off at a set time, approximately 4 - 6 hours. In my case, this includes my vacuum pump system. The purpose of the fans are to move the air, so that the temperature is even.

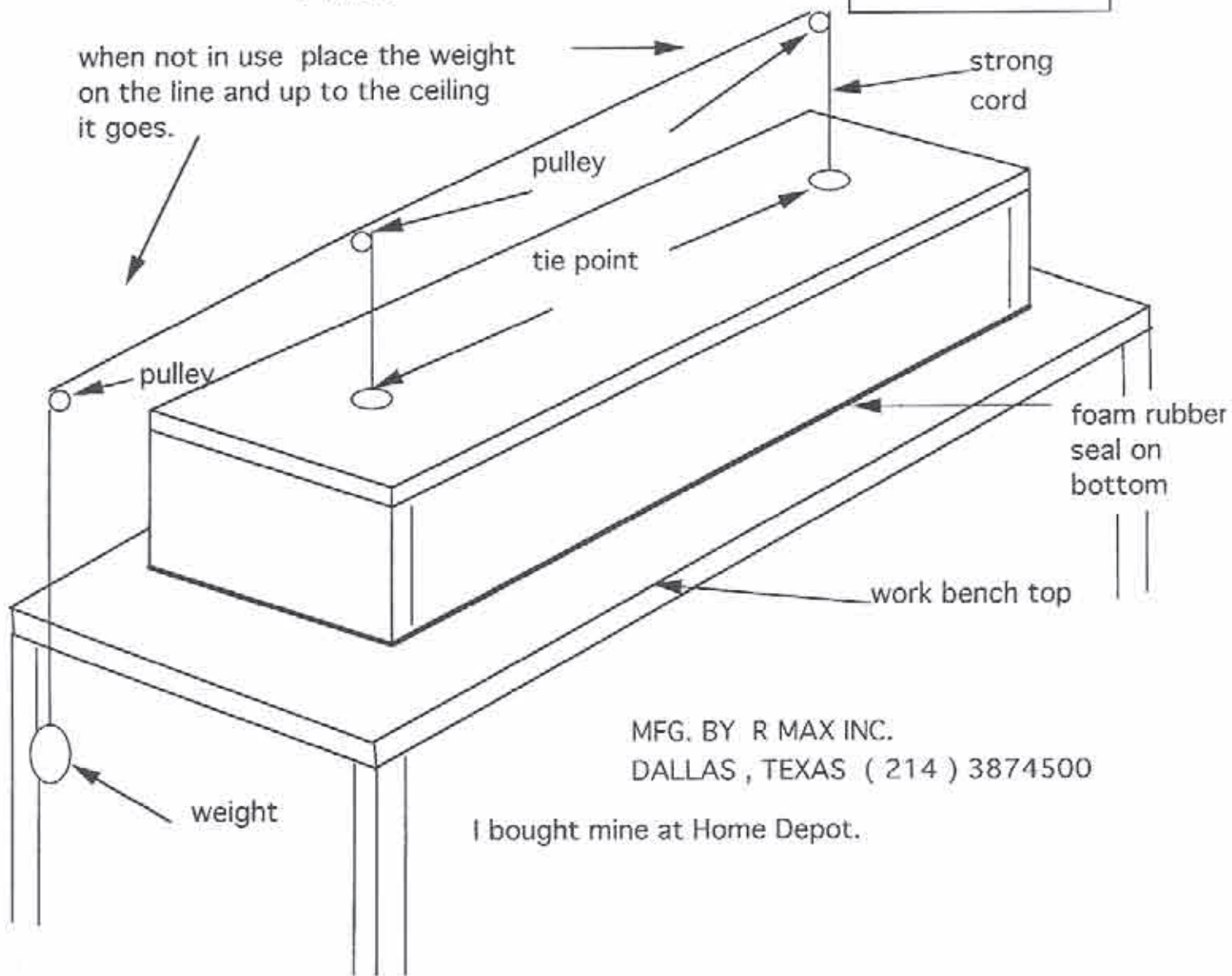
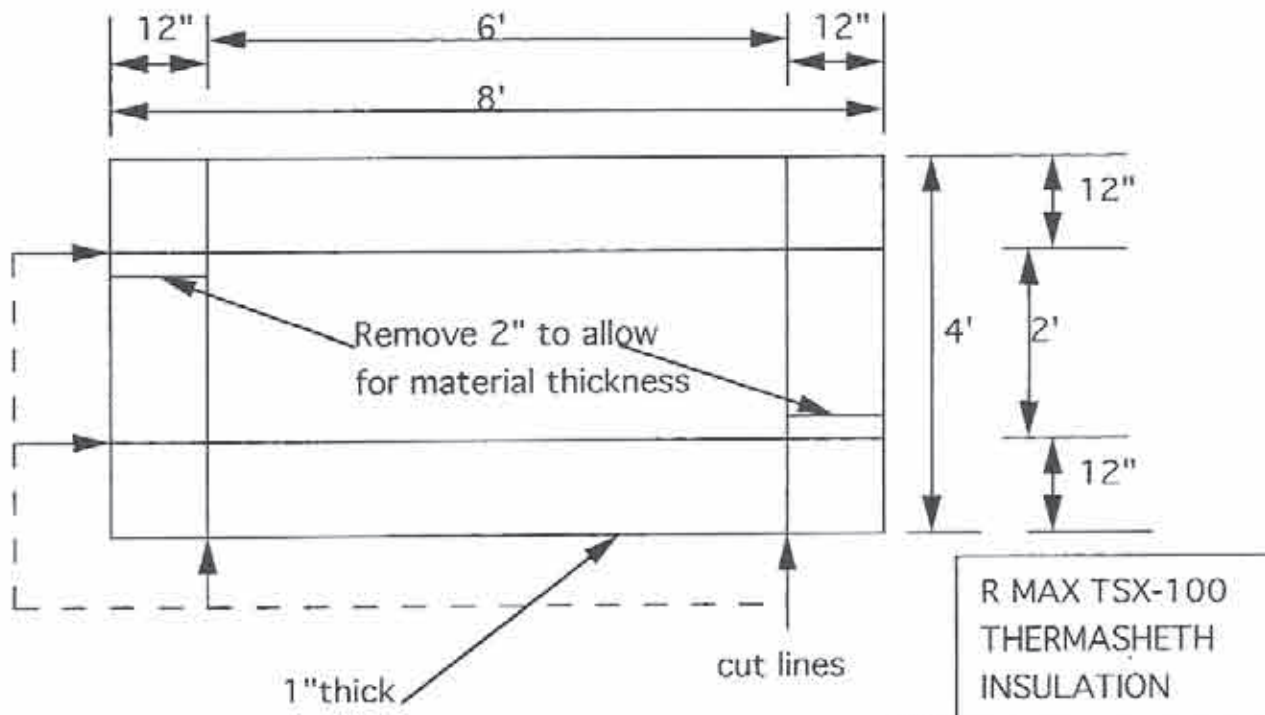
More...

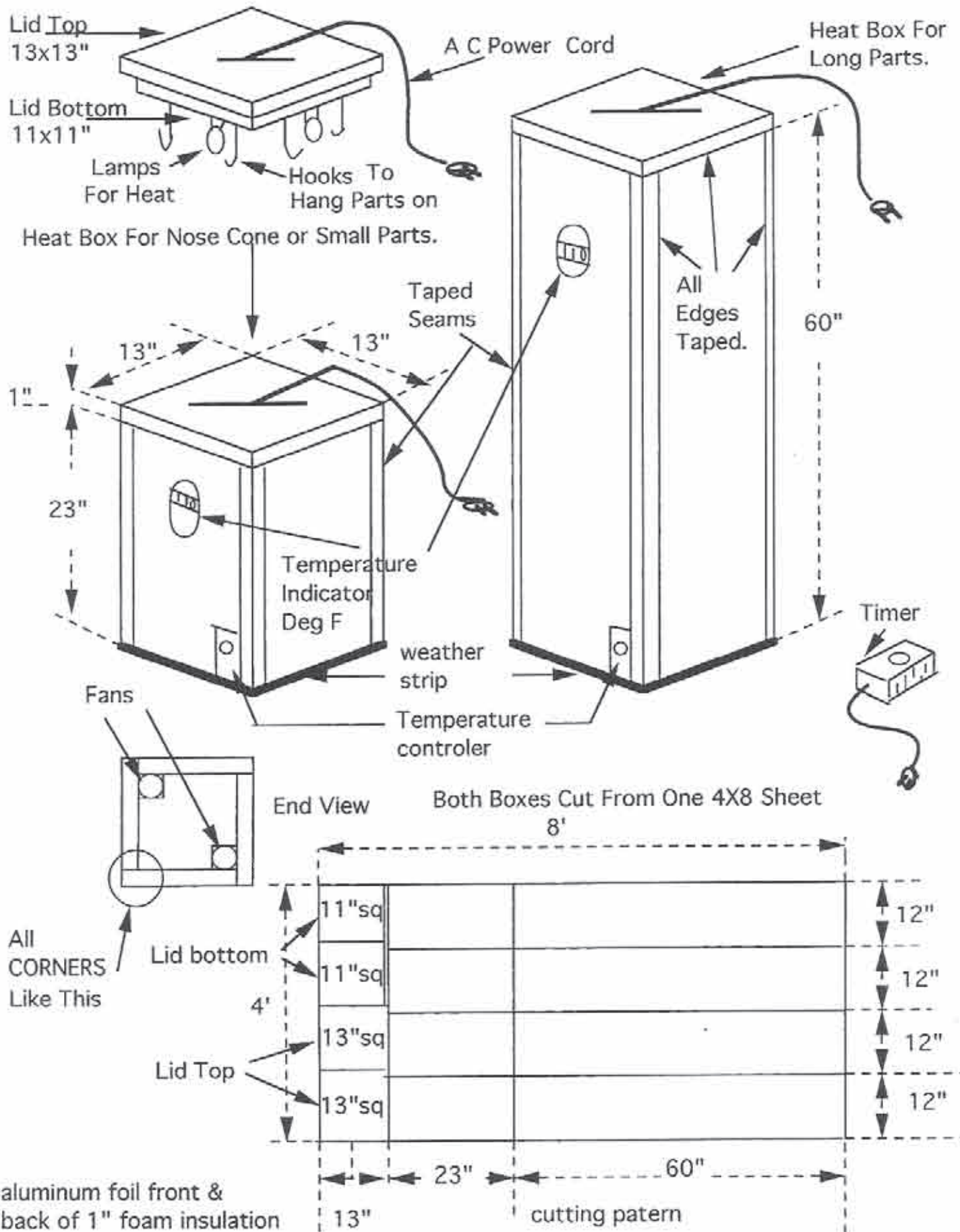
In addition to curing wings, I have since built two more heat boxes. One is small for curing short items like nose cone molds, a nose cone in a mold, or any item not longer than approximately 20 inches. The second box is for fuselage molds, a fuselage in a mold, or any long, slim part not longer than 57 inches. The boxes could be stacked for a very long part, 77 inches. Both boxes are also made from one 4'x8'x1" sheet of foil surfaced insulation foam.

All three boxes can be built from 2 sheets. The small fans and temperature indicators were purchased from Radio Shack; the temperature controllers and lamp sockets, from a hardware store, Orchard Supply. The lamps are, of course, the heat source; the fans keep the air moving to maintain an even temperature.

If you have any questions, just give me a call at (408) 629-1325. ■







Wind Tunnel Tests of Wing Profiles

...by Martin Simons
Stepney, South Australia

(An expanded version of a talk given at the LSF Conference held at Jerilderie, New South Wales, Australia, Easter 1996.)

Part VII

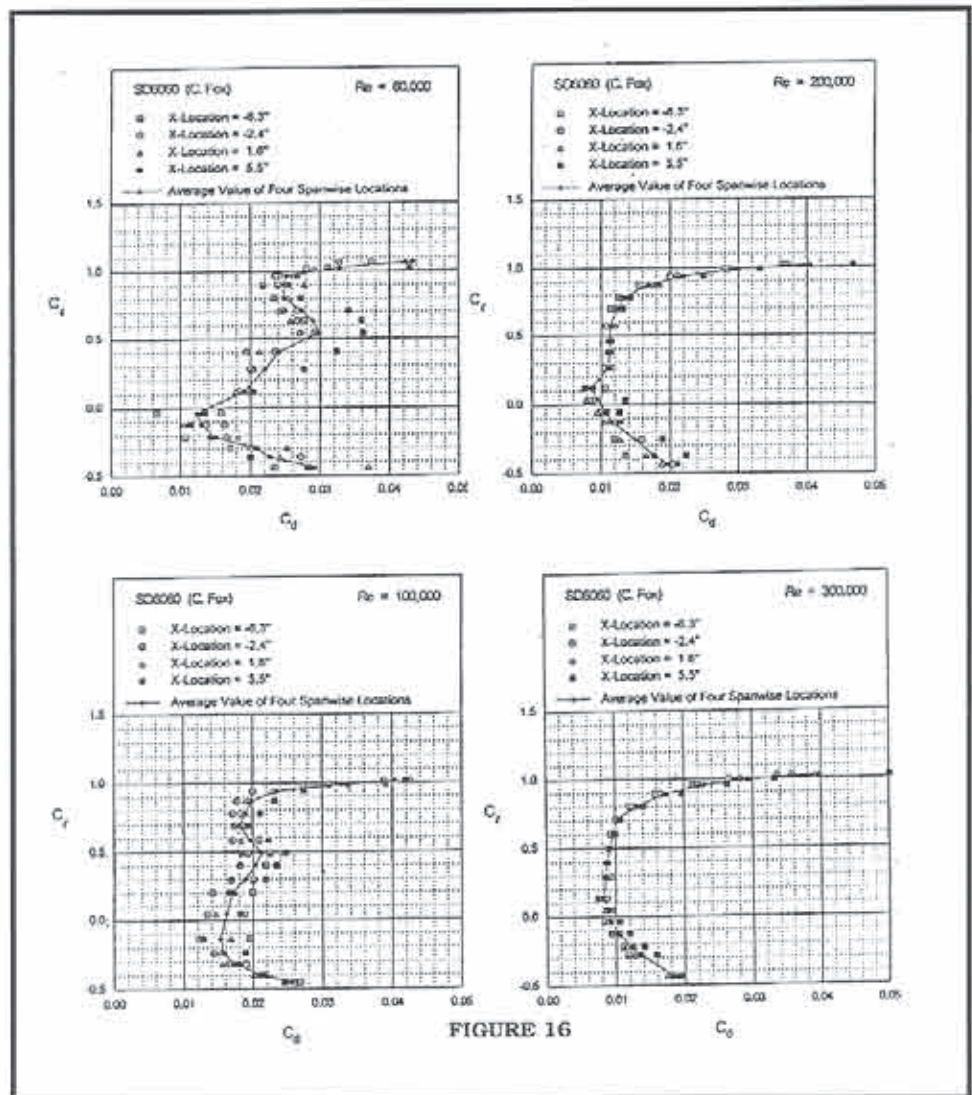
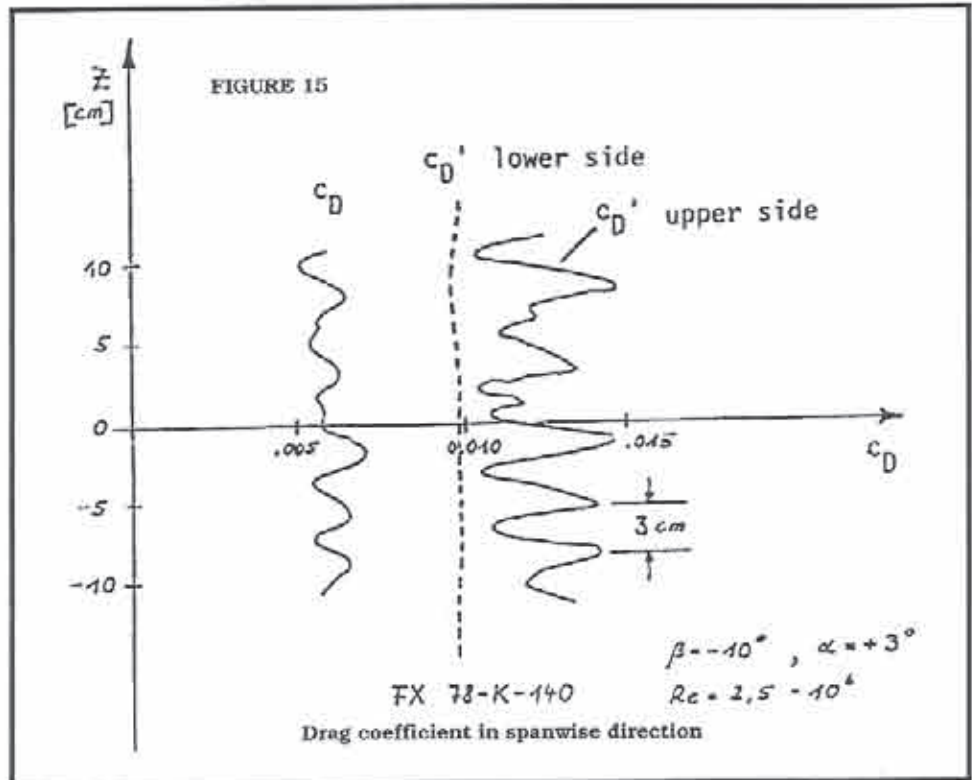
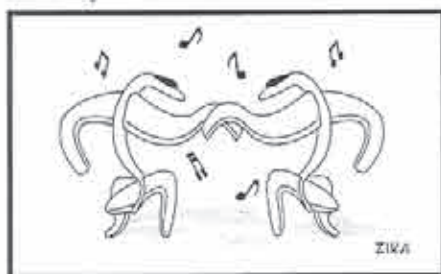
Boundary layer vortices in the wind tunnel

All the wind tunnel measurements now are based on the assumption of two dimensional airflow, in the boundary layer as well as in the main airstream generally. It turns out that this assumption is not quite correct for small wings at low Re numbers. It was shown some years ago, by the Stuttgart team, that behind a separation bubble the flow is not truly two dimensional. Very tiny vortices, or twisting threads of air, form in the boundary layer. There are no large wing tip vortices, but there are these little vortices buried in the wake. It is not enough to put the wind tunnel drag comb at one location. It may be probing the inner core of a small vortex. If it is slightly shifted to one side, it may be at the edge of a vortex. The drag measured is different and, since the quantities involved are so small, there may be quite a lot of difference in percentage terms (Figure 15). To get the whole picture, the drag rake really should track systematically across the entire test section. Near the tunnel walls, however, there is interference caused by the boundary layer and drag of the walls themselves, so measurements there are not much use. The sampling of the flow has to be done over a range from the centre of the test section to a certain distance on either side, and the average value is accepted.

In both Selig's wind tunnels, the comb was positioned at four different locations and the kind of variation resulting is shown in Figure 16 (UIUC Fig 2.9). Notice especially how much variation there is at the low Re number of 60,000, which is in fact very close to the Schmitz critical Re for this profile. Large separation bubbles have formed and at this Re are on the verge of bursting. As the Re increases, the spanwise scatter in the measurements becomes less, but it is still there to some extent at Re 300,000.

The drag figures published from Princeton and UIUC are therefore averages of the separate measuring points in this spanwise sense. As mentioned above, this was not done with the earliest Stuttgart and Delft tests, but the method was introduced there later. ■

(Part VIII continues the discussion with "The New Profiles". Ed.) ■



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Hobie Hawk in box, with extra tail feathers. It has the last manufactured left wing panel. Pictures available on request... \$200.00. Tom Haake, (215) 322-1449, Pennsylvania.

Sky Hawk by Mark Allen, gelcoated fuselage, all servos installed, add receiver & battery and go fly... \$350.00 - will pay shipping. David, (910) 764-4137, <d9inger@ibm.net>, North Carolina.

Levoe Varmint speed 400 racer, NIB... \$60.00 ppd in Cont. U.S. Rob, (760) 930-0616, 'til 10 p.m. PST, California.

Satum 2M... \$300.00, ask about servo; WindDancer, my own design, have 4 to sell, a lot like the Falcon, 110" - 118" span, various airfoils... \$350.00 ea.; Synergy 91, very nice... \$400.00, ask about servo. Dale (Head Elf) King, (972) 475-8093, Texas.

1/4 Roebers Pilatus B4, 3.75 meter span (147"), wing profile Ritz 3, NIB... \$495.00; 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, Briston 3.2 or similar), NIB... \$385.00; 1/4 Rosenthal Valley Morane (towplane), 2.78 meter span (109"), NIB... \$295.00; 1/5 Wik Twin Astir, all glass, NIB... \$595.00. Contact Robin Lehman, 63 E. 82nd St., New York, NY 10028; (212) 879-1634.

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Dec. 6	Slope Combat	San Diego, CA	Arthur Markiewicz, (619) 753-3002
Dec. 7	Open TD Contest	San Diego, CA	Patrick Dionisio, (619) 586-7997
Dec. 13	60" Slope Race	San Diego, CA	Bob Matheson, (619) 754-2657
Dec. 14	F3J	San Diego, CA	Mike Ziaskas, (619) 484-7596
1998			
Feb. 15	GDS&HS Sno-Fli	Detroit, MI	Dave Corven, (248) 656-1879
June 11-14	Elmira Aerotow '98	Elmira, NY	John Derstine, (717) 596-2392 johnders@postoffice.ptd.net
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R/C Soaring Resources

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

Contacts & Soaring Groups - U.S.A.

Alabama - North Alabama Silent Flyers, Ron Swinehart, 8733 Edgehill Dr. SE, Huntsville, AL 35802; (205) 883-7831, <Rswineha@svl.ems.lmco.com>.

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

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

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

California - California Slope Racers, John Dvorak, 1063 Glen Echo Ave., San Jose, CA 95125; (408) 287-0375.

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

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

California - South Bay Soaring Society, A.J. Angelo, P.O. Box 2012, Sunnyvale, CA 94087; (415) 321-8583, fax (415) 853-6064.

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), Jack Cash (President), (301) 898-3297, e-mail BadIdeas@aol.com; Bill Miller (Sec./Tres.), (609) 989-7991, e-mail JerseyBill@aol.com; Michael Lachowski (Editor), 448 County Rt 579, Milford, NJ 08848, e-mail mikel@airage.com.

Florida - Florida Soaring Society, Mark Atzel (President), 1810 SW Terrace, Ft. Lauderdale, FL 33312, (954) 792-4918.

Florida (Central) - Orlando Buzzards Soaring Society (www.specs-usa.com/~ingo/OrlandoBuzzards), Don Cleveland (Pres.), 1515 Cuthill Way, Casselberry, FL 32707, (407) 696-7516, <Dclevel130@aol.com>.

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

Hawaii - Maui Island Slope Soaring Operation, MISO, Hank Vendiola, 10-CAI St., Makawao Maui, HI 96768; (808) 572-5283.

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

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

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

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

Kansas - Aerotowing, Jim Frickey, (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>.

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

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

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

Michigan - Greater Detroit Soaring & Hiking Society, Greg Nilsen (Sec.), 2163 Highsplit Dr., Rochester Hills, MI 48307; (810) 651-8598, 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.

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

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

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

Nevada - Las Vegas Soaring Club, Jim Allen (President), 7117 Caprock Cir., Las Vegas, NV 89129; ph (702) 658-2363, fax (702) 658-1996.

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

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

New York - Elmira - Harris Hill I/D R/C, aerotowing & slope, John Derstine, (717) 596-2392, e-mail 2076482@mcimail.com.

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

New York - (Buffalo/Niagara Falls area) - Clarence Sailplane Society, Lyn Perry (President), (716) 655-0775; e-mail perryly@staff.sunysie.edu; Jim Rollier (Competition Coordinator), (716) 937-6427.

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

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: parrot2l@uic@aol.com, (206) 874-2429 (H), (206) 655-1167 (W).

Ohio - Cincinnati Soaring Society, Chuck Lohre, 3015 Beaver Ave., Cincinnati, OH 45213; (513) 731-3429, lohre@iac.net, http://www.iac.net/~lohre.

Ohio - Dayton Area Thermal Soarers (D.A.R.T.S.), Walt Schinoll, 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 tomnagle@freenet.columbus.oh.us.

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

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

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.europa.com/~patch/

Oregon - Salem Soaring Society, Al Szymanski, CD, (503) 585-0461, http://home.att.net/~asz/sss/> for club's home page.

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) 758-1842.

Tennessee - Tullahoma (Southern Middle Area), Coffee Airfoilers, Herb Rindfleisch, 106 Inglewood Circle, Tullahoma, TN 37388, (931) 455-1836, <herb@cafes.net>.

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

Texas - aerotowing, Dallas area, Andrew Jamieson, 9426 Hillview, Dallas, TX 75231, (214) 349-9346, e-mail ajsleep@aol.com, ph/fax Larry Sengbush, (972) 291-4840.

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

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

Virginia - Appalachian Soaring Association, Virginia's Southwest (Bristol area), Greg Finney, 106 Oakcrest Circle #5, Bristol, VA 24201; (540) 645-5772, e-mail <gfinney@naxs.com>.

West Virginia - Cup Vignolini, 1305 Perry Ave., Morgantown, WV 26505; (304) 598-9506, <yvne30a@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, <74724.65@compuserve.com>.

Outside U.S.A.

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

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

Canada - MAAC Men Gilding 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 (Thermal Talk & Europe), Jack Sile (Editor), 21 Bures Close, Stowmarket, Suffolk, IP14 2PL, England; Tele. # 0449-675190.

England (southwest) - Sean Walbank, Woolcombe Hays, Melbury Bubb, Dorchester, Dorset, DT2 0NJ, phone 01935-83316.

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

Japan - Dr. Paul "Sky Pilot" Clark, 2 - 35 Suikoen Cho, Hirakata Shi 573, Osaka Fu, Japan; IAC+(81) 720-41-2934, <pclarck@osk33web.ne.jp>

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

Seminars & Workshops

Free instruction for beginners on construction & flight techniques, week-ends (excl. contest days), "A" Angelo, South Bay Soaring Society (San Jose area), (415) 321-8583.

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Reference Material

"Summary of Low-Speed Airfoil Data - Volume 1" & "Volume 2", Michael Selig wind tunnel testing results. Cost for each: \$25 USA (includes postage), \$29 surface outside USA, \$31 air Western Hemisphere, \$38 air Europe, \$42 air all other countries. Computer disk, ascii text files (no narrative or illustrations), is \$15 in USA; \$16 outside USA. Source for all "SoarTech" publications, also. Contact Herk Stokely, 1504 N. Horseshoe Cir., Virginia Beach, VA 23451. Phone (757) 428-8064, email: herkstok@aol.com.

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BBS/Internet

Internet - Email list/resource of RC soaring related folks, including US and international club contacts, vendors, kit manufacturers/distributors, software, equipment and supplies. Check out the web site: www.ocpapsych.com/yellow.htm, or contact Manny Tau at taucom@kaiwan.com.

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

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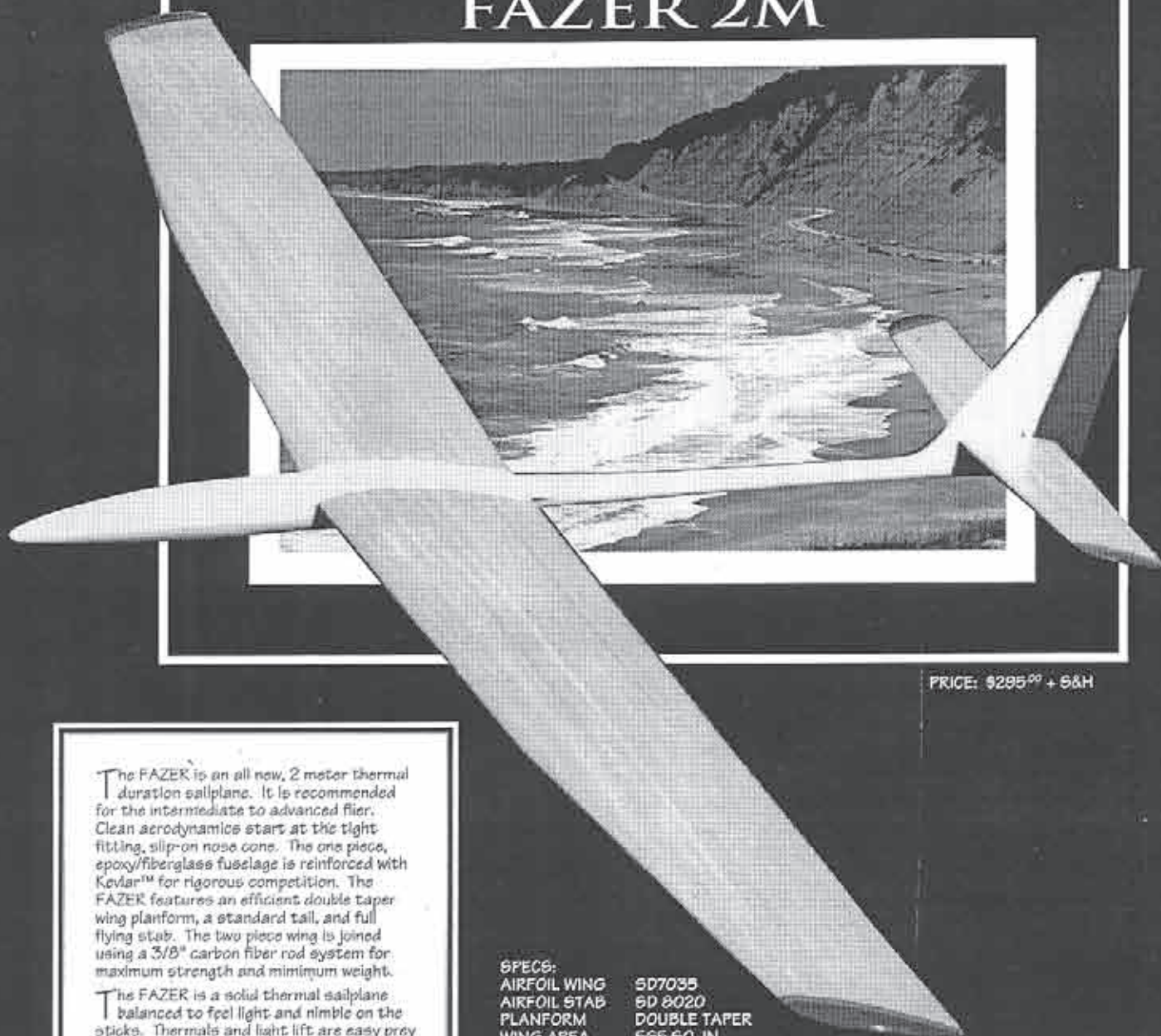


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