RC Soaring DIGEST

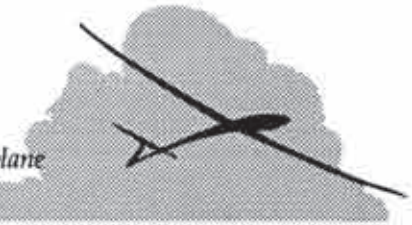
June, 1993
Vol. 10, No. 6

U.S.A. $2.00
Canada/Mexico $2.50

Making a Fiberglass Mold
David Friant shares mold making techniques on page 4. David Friant (R), Dan West (L).

R/C Soaring Digest

A publication for the R/C sailplane enthusiast!



Advertiser Index

Table of Contents

Other Sections

Special Interest Groups

R/C Soaring Digest (RCSD) is a reader-written monthly publication for the R/C sailplane enthusiast and has been published since January, 1984. It is dedicated to sharing technical and educational information. All material contributed must be exclusive and original and not infringe upon the copyrights of others. It is the policy of *RCSD* to provide accurate information. Please let us know of any error that significantly affects the meaning of a story. Because we encourage new ideas, the content of all articles, model designs, press & news releases, etc. are the opinion of the author and may not necessarily reflect those of *RCSD*. We encourage anyone who wishes to obtain additional information to contact the author. *RCSD* was founded by Jim Gray, lecturer and technical consultant. He can be reached at: 210 East Chateau Circle, Payson, AZ 85541; (602) 474-5015.

RCSD should not be considered to endorse any advertised products or messages pertaining hereto. An advertising rate card is available for businesses, clubs and personal advertising.

R/C Soaring Digest is printed on recycled paper.

RCSD Staff

- Jerry Slates — Editor/Technical Editor/Jer's Workbench
- Judy Slates - Publisher/Submission of Mat'l Via Disk (MAC or 5.25" 360K MS-DOS or any 3.5" MS-DOS formated)

(Printing by J. Morgan Graphics & Design, (510) 674-9952)

Feature Columnists

Wil Byers, Mike Bamberg, Gordon Jones
Bill & Bunny Kuhlman (B^2)
Martin Simons, Ed Slegers

Questions About Radios??

Contact David Woodhouse, 96 Division Street, Guelph, Ontario, Canada N1H 1R6; (519) 821-4346 between 19:00 - 21:00 EST.

R/C Soaring Digest
P.O. Box 2108
Wylie, TX 75098-2108 U.S.A.
(214) 442-3910, FAX (214) 442-5258

The Soaring Site

Thank-you for Your Calls & Concern!

Yes, Wylie, Texas made the news. A tornado touched down and went through the main streets of downtown on Mother's Day. Fortunately, it did miss us, but not by much. We did not sustain any damage. We wish to thank each of you that called or had someone else call to find out if we were OK. Hopefully, we won't see the likes of this again!

Mid-South Soaring Championships

We received an update on the Mid-South Soaring Championships which will be held in Huntsville, Alabama on June 26th & 27th. Ron Swinehart says, "A conservative count of attending pilots totals approximately 93, with attendance from ten states. We have had a fair response from vendors in our request for donations to be given away free to all who enter this event. The rough total to date is over $2400 worth of merchandise ranging from kits to discounts on sailplanes and related merchandise. MASS will be holding a raffle with the lucky winner receiving a JR388s radio. Proceeds from this effort will go towards next year's contest to be held in Memphis."

"We expect to put out four strong winches with retrievers and have developed a database for the pilots, such that they will be sorted by flight group such that there will be no frequency interference with the group before or following an individual's flight group. An impound area and procedures have been developed along with the use of a frequency scanner to preclude the inadvertent submission of a radio to the impound area while still on. Food will be available at the site both days, along with a planned dinner for pilots and families on Saturday night."

If you are planning on attending but have been putting it off, please call Ron at

work at (205) 430-0113 or at home at (205) 883-7831 and help them out by getting your name into the database early. If you have been thinking about attending but don't know who is coming from your area, and would like to car pool with others, Ron can help you out with that, as well. The pre-registration form is on page 58 in the April, 1993 issue of *RCSD*.

Who exactly will be there? Well, 10 states covers quite a big area, but many of the same folks who attended last year, of course! The write-up was included in the October, 1992 issue of *RCSD* on page 20. Remember the "bet"? Yes, David Layne will be back, but this time he has a different bet in mind.

David says, "I'm making the trip from California again this year because I had so much fun last year. I'm really looking forward to being there! But thinking ahead, I know that the weekend will eventually end and it will be another year before I have the opportunity to fly with most of the folks again. So, I would like to make a bet with anyone that is interested and it goes something like this: If I beat you, then you have to come to California for a contest and fly with me. Of course, if you have a more interesting bet in mind, I'm open to suggestions."

Also, the response from sailplane related advertisers for the trade show has been quite good to date, with material already starting to arrive. Hope to see you there!

Landowner Protection

We received a newspaper clipping from Jim Culleton of Los Osos, California. He says, "As a long time subscriber of *RCSD*, I thought that you may be interested in this article and might pass it on in the magazine to people in California."

The article appeared in the Los Angeles Times the week of March 8th or 14th and the headline says: "Landowner Protection Is Upheld - Private property used for recreational purposes is immune from lawsuits, state high court says. Dissenters say it will limit personal injury claims." The article is written by Philip Hager, Times legal affairs writer. The headline pretty much says it all. If a landowner allows someone else to use their land for recreational purposes such as hunting or bird watching, then they are protected from being sued for ordinary negligence by anyone injured on the property. Of course, there is a clause about the property being suitable and well maintained. Let us know if you would like a complete copy of the article.

World Postal 2M

Last year, *RCSD* readers received an invitation from Morten Munkesoe to join in World Postal competition with S.M.S.K. (Sealand's Model Soaring Club, Denmark). Morten has sent in the details for this year's event. The same rules apply as last year and can be found in the July, 1992 issue of *RCSD* on pages 34-35. The score sheet is in the August, 1992 issue, page 56. Also, Steen Hoej Rasmussen is the contact person again this year; the addresses are the same. The days chosen for the event are September 26 and October 3, with the deadline for results, November 5th.

Additionally, Morten says, "We hope you are doing all right over there, and that you have some interesting projects ready for the next season. Personally, I can inform you that I have acquired a quite interesting drawing of a 2m soarer only using the wings for maneuvering, and the V-tail is fixed. Perhaps you have tried a similar system on your planes, as it is very simple indeed and only requires two servos. Anyway, it could be a fresh blow to the 2m class, as the quite traditional types we are using for the time being, can seem a little boring at times.

"...I would like to tell you a little about our club, S.M.S.K.

"S.M.S.K. was started up 16 years ago by a group of enthusiastic people, who all had their hobby in common - R/C Soarers. From the beginning, the major interest in the club was the F3B which was very popular in the late 70's. Somehow, this class has slowly faded out on the Island of Sealand. The reason for this development was not obvious, but the tendency to get cheaper planes made of balsa, and the fact that the way of competing required a whole bunch of people to measure and ring bells and so on, were probably some of the reasons.

"S.M.S.K. is, today, still a pure R/C soaring club, and as far as we are concerned, the only pure soaring club in Denmark. We are most related to thermal soaring, but this will probably change in the future, as many members are building slope planes for the time being. We are in a very lucky situation to have excellent thermal conditions on "Stensletten" in the summertime. But at the same time, a huge hill is located only 500 yards away, so we can do nice slope flying, too.

"Last year, we had a large increase in club members (8), and this is perhaps caused by the articles in our Danish magazine *Modelflyve-Nyt* concerning the postal event. Also, at least 5 motor clubs have been closed down on Sealand in 1992, caused by problems from noise. S.M.S.K. is located only 10 miles from center to Copenhagen, and this is only possible because of our silent hobby. Today, we have 35 members in S.M.S.K.

"We have decided to choose two fly days for this event this year, as many pilots were grounded last year due to poor weather conditions.

"You can fly on the first day or the second day or both days, depending on how much time you will spend on the arrangement.

"You must fly two rounds to be able to win the contest. As last year, the idea is that anyone flying more than two rounds can choose the best results achieved during the flying days.

"You are not allowed to mix results from the two flying days (e.g., 1st round from 1st day, and 3rd round from 2nd day).

"The actual contest is carried out on your own airfield on September 26th and October 3. Minimum of 2 rounds are to be flown and the best 2 count. Contest results are to be received by the contact person by November 5th. The winner will be contacted directly and awarded.

"Hint: the big idea is to concentrate on the landings. Skip the last 5 seconds and try to make a first class approach and landing. If you do it this way, you have lost 5 points, but gained 150 points."

SOAR - TEXT, INC.

It has been gradually more time consuming each month trying to keep up with all the different aspects of *RCSD*, particularly as it relates to ad copy, so imagine our delight when Mike Bamberg suggested that Barry Kurath give *RCSD* a call. Well, Barry Kurath is a sailplane enthusiast in the Oregon area of the Northwest and he does ad design and typesetting, not to mention a whole host of other services, as well! An ad for his business, SOAR-TEXT, INC., is included in this issue of *RCSD*, so if you need help with your advertising or want a really new look, give Barry a call and see what he can do for you. A complete mailing to all current advertisers will be done within a month, providing more detail on Barry's services. While small changes in existing ad copy can continue to be done by *RCSD*, if you have complete ad changes and/or rewrites, and do not have camera ready copy, we will probably direct you to Barry for help. We want to continue to get *RCSD* out in a timely fashion, and believe that this change will benefit readers and advertisers alike. Thanks! ■

Happy Flying!
Jerry & Judy

Making a Fiberglass Mold

...by David W. Friant
Wright Manufacturing Co.
Bellevue, Washington

I designed a small handlaunchable sailplane last summer (1992). Since the day I first flew this sailplane I envisioned building a one-piece fiberglass fuselage for it. In my quest for information related to fiberglass mold making I ended up following Jerry Slates' process of making a fiberglass mold (see *R/C Soaring Digest* Jan, Feb, Mar 1993). The following describes my experience making a fiberglass mold.

Making a fiberglass mold, or fiberglass tooling, is a skill that can require a number of years of schooling and great commitment to become a journeyman "mold maker". I realized from the start that if I was to be successful the first time out I would need to combine the skills of a number of individuals in order to produce a mold that would be considered "good".

I was fortunate to enlist the help of a good friend and soaring buddy, Dan West, who is an accomplished craftsman, to carve and prepare the plug for this mold. The plug, which is a precise solid model of the finished part you wish to produce, is 65% of the work involved in making a mold. With the many hours of work Dan put into this project, and the many hours his wife put up with it, this project became as much his as it was mine.

While Dan was shaping the plug, I was gathering and reading as much information as I could find regarding fiberglass mold making. The search for information led to a local company, Fiberlay, Inc., that caters to the fiberglass hobby industry. The manager of the company, Bill Wood, took the time to read Jerry Slates' articles in *R/C Soaring Digest* Jan-Mar 1993, so he could understand exactly what I wanted to accomplish, and

then tutored me throughout this whole process with my commitment that I would purchase from them the necessary products to make the mold. With a very experienced and accomplished craftsman shaping the plug, the help of a mold-making tutor, Jerry Slates' articles from *R/C Soaring Digest*, my wife's loving understanding, my goal, and of course, my pocketbook I had an enthusiastic team helping me make this vision become a reality.

As mentioned above, the plug is 65% of the work involved and your finished parts are an exact replica of the plug. Any imperfection in your plug will show through in your finished parts. I could write an entire article devoted to making a plug. If the plug sounds intimidating, it can be. If you are serious about making a mold that can be used in a production environment, I highly recommend enlisting the services of an experienced craftsman to shape and prepare a perfect solid model of your part.

In the case of this project, the plug was made from poplar wood. Three pieces of poplar were laminated together to ensure the plug would have a long shelf life without twisting or warping in any way. If the plug proves to produce a good fuselage then the plug will be used to make multiple molds. ...Skipping ahead 30 hours... Once the final shape of the plug was agreed on, the plug was then prepared for the mold making process.

Preparing the plug for mold making is a multiple step process. The first step is to construct the dams which allow access to the inside of the mold when the two halves of the mold are bolted together. (See *R/C Soaring Digest* Jan. 1993 for a detailed description of dams.) After the dams are in place the next step is to coat the entire plug and dams with a thinned coat of polyester laminating resin. This first coat seals the pores of the wood and provides a base coat for the second layer. After the first coat was sanded out we

applied a second coat of unthinned polyester laminating resin and sanded this coat out. The next step was a suggestion from our tutor. We sprayed the plug with 2 coats of black Ramanel. Ramanel is a catalyzed polyester enamel. Ramanel provides a tough, durable, scratch-resistant high gloss finish. The best way to describe the Ramanel finish is to liken it to a jet black "Baby Grand" piano. Ramanel proved vital in allowing the plug maker to work out any imperfections before we laid up the mold. Once satisfied with the surface of the plug, the plug was buffed and polished with buffing and polishing compounds. After the polishing was complete, five coats of mold release wax were applied according to the manufacturer's recommendations. At this point the plug was ready to mount in the table.

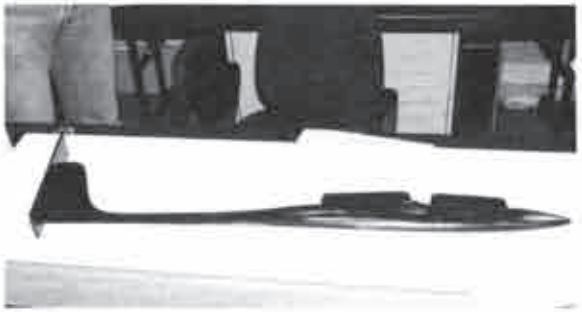
A table was built per Jerry Slates' instructions and using a saber saw a perfect outline of the plug was cut in the table top. (See *R/C Soaring Digest*, Jan. 1993 for a description of mounting the plug in the table.) The plug was mounted, as Jerry explains, with wood blocks under the opening in the table to provide a mount for the plug. Modeling clay was placed on top of the wood blocks and the plug was fitted into the cut out and pressed into the clay until the centerline of the plug was flush with the top of the table. The small crack between the table and the plug (about 1/32") was filled with modeling clay. Now that the plug is mounted in the table, the table has become part of the plug. At this point I consider the plug completed and 65% of our work done.

In preparation for laying up the mold we waxed the table top and the clay filled crack with only two coats of mold release wax. Following the manufacturer's recommendation we waited two hours between each coat of wax. The plug and the table sat overnight.

To obtain the best results we decided to spray the PVA mold release instead of trying to brush it on. I broke down and bought an air compressor, spray gun and air accessory kit. Being our first time to work with PVA we received instruction from our tutor and then cautiously proceeded to spray PVA. Not really knowing if we sprayed it too thick or too thin (How do you visualize 2-3 mils, 1/64th is small enough!), we waited until the next morning when our tutor, who is now fully engrossed in this project, showed up to show us how to lay down the first layer of tooling gel coat. (In review the PVA mold release had been applied correctly and we were ready to proceed.)

Nine ounces of black tooling gel coat was catalyzed and thinned with one ounce of acetone and sprayed on the plug and table using a spray pot and air compressor. The gel coat was allowed to set for about 1.5 hours. (Spraying polyester tooling gel coat can be very dangerous. You must have very good ventilation!) The gel coat was watched closely and as it began to set we mixed a pot of polyester

resin mixed with colloidal silica until it had the consistency of vaseline and set it aside without catalyzing it. We waited until the gel coat passed the finger test. (When you can stick your finger on the gel coat and it leaves a finger print but does not leave a black mark on your finger the gel coat has passed the finger test.) We sprayed a second nine ounces



of tooling gel coat and waited for it to pass the finger test. We now have about 35-40 mils of gel coat built up on the plug and table. The vaseline was then catalyzed and was used to bridge the space between the dams and provide a fillet around the perimeter of the plug against the table to smooth the surface in preparation for the first layer of mat. We waited until the vaseline passed the finger test. Five ounces of polyester resin was then catalyzed and used to lay down a layer of 3/4 oz. glass mat on top of the gel coat and putty. After the 3/4 oz. glass mat passed the finger test we laid down another layer of 3/4 oz. glass mat.

In review, at this point we have two layers of tooling gel coat, followed with polyester putty to fill the space between the dams and provide a fillet around the perimeter of the plug, followed with two separate layers of 3/4 oz. glass mat. We called it a day and let everything set up overnight.

Bright and early the next morning we began the final layup of the first side of the mold. Three pots with 6 oz. of polyester resin were measured and put aside. Three oversize outlines of the plug were cut out of 1.5 oz. glass mat. We then laid up all three layers of glass mat one right after the other catalyzing each pot of resin just before applying each layer. We then let the mold sit overnight to fully cure.

At this point we are ready to pop the plug and first half of the mold off the table. We stood the table on its side and pushed on the plug from the backside. Expecting that it would be trouble getting the plug and mold to release from the table I was relieved when both the plug and the mold released with ease.

Next the alignment divots were ground into the surface of the flange with a dremel moto-tool per Jerry Slates' instructions. We spent an hour carefully cleaning the clay residue and PVA off the mold flange. When all looked well the plug and the flange were waxed. Since the plug already has 5 coats of wax on it we spent most of our effort waxing the mold flange paying careful attention to waxing the alignment divots. Two coats of wax were applied waiting two hours between waxing and polishing. A layer of PVA was sprayed over the entire plug and flange and allowed to dry.

We then began the layup of the second half of the mold. We maintained detailed documentation on the first side of the layup in order to layup the second side exactly the same. This is important so that both sides of the mold cure the same. After the second side was laid up we

allowed the mold to cure for two days. After two days the flange was trimmed with a dremel tool and I cemented strips of oak plywood along both sides of the flange using polyester putty to stiffen the flange and provide a surface for the bolts to be mounted. Bolt holes were drilled about 4-5 inches apart and 1/4" thumb bolts with tee-nuts and washers were installed to clamp the mold together for the rest of the curing time and for holding the mold together when making parts. After the bolts were installed we allowed the mold to cure for another two days before opening the mold. The anticipation of what we were going to find inside when we opened the mold was agonizing. Would we have a perfectly shiny hole free surface? Or would we find shrinkage and an allegated surface requiring us to redo the mold? Tick, tock...tick, tock.

We were relieved to find a beautiful shiny surface when we opened the mold. The mold halves came apart with ease. We simply pulled on the fin dams and using some small wood wedges to slide between the two halves the mold came right apart. The plug was removed and was in perfect shape ready to make another mold. In speaking with other people I understand that finishing the plug with a good surface is a requirement to allow you to use the plug to make successive molds. The choice of using Ramanel really paid off. The plug looked no different than when we began. We bolted the two halves of the mold back together and proceeded to cut the dams off the plug. Using a dremel tool with a cutting wheel the dams were cut off allowing access into the mold. A dremel grinding wheel was then used to carefully trim the openings and smooth the edges of the mold.

Using 1500 grit sandpaper we carefully sanded the interior of the mold to knock off any fish eyes that now stood out as a small bump on the surface. Next we used a cleaning and polishing compound to smooth out any scratches in the finish. The mold was then waxed twice in preparation for the first layup.

At the time of finishing this story on making a fiberglass mold I have laid up four parts and have found it to be fairly straight forward. I truly benefited from Jerry Slates' articles in *R/C Soaring Digest* on how to make a fiberglass mold. Thank you, Jerry, for providing the necessary information for us all to benefit from. Until I read Jerry's articles I had no idea how to go about making a mold. As I read his successive articles the picture began to unfold and with a lot of perseverance and help from a great team of people I have experienced the art of mold making. In fact I must say that we have produced a professional quality fiberglass fuselage. I have sent Jerry a fuselage to inspect and am anxiously awaiting his critique.

Thanks to the team for a job well done.

Dan West, Specialty Interiors, 206-488-9045 (Custom Plugs)

Bill Wood, Fiberlay, Inc., 206-782-0660 (Fiberglass Materials and Services)

David W. Friant, 206-488-6558 ("The AVION" Fuselage) ■

Jer's Workbench

Mold Making Techniques

David Friant had some questions during his mold making process that some of you folks may have as well. So, I thought I would share his questions, my answers, and the critique of his finished fuselage.

David did indeed send me one of his fuselages, his fourth one to be exact; he was as proud as a new mother, and had every right to be. He said that each fuselage was becoming progressively better and, as we talked, he was working on the canopy hatch, and was almost ready to try doing a lap seam. The fourth fuselage had a 1" fiberglass tape to join the two fuselage halves together. As soon as David incorporates the lap seam into his work, this should drop another 1/2 oz. or so from the gross weight of the fuselage. The quality of David's work is very good and will compete with any commercial fiberglass fuselage on the market, today. Fuselage #10 is in the mail and I hope to see it, soon.

Q: The biggest setback that we experienced was a problem with the tooling gel coat. After we would spray the second layer of gel coat, apply the putty and just before it was ready to have the first layer of mat applied, the gel coat flange would pull off the table and warp. We would strip it off, clean it up, and try again. We finally came to the realization that we had too good of a release on the table. The gel coat would stick to the PVA, but the PVA wouldn't stay stuck to the table when the gel coat began to set up and tighten or shrink. This was very frustrating. I ended up sanding the table top with 120 grit sandpaper and waxed it once, sprayed PVA, and it stuck. What do you think? I also want to try an epoxy mold next time.

A: In my readings on tooling gel coat warping, I have found that all the manufacturers say not to add anything to their products, or anything that could contaminate their product. If you have to thin the gel coat to make it more workable, I suggest a styrene thinner. Do NOT use alcohol or acetone.

Q: Is the Bet-r-Products surface coat an epoxy tooling gel coat? What are the pros and cons on polyester molds vs. epoxy molds?

A: An epoxy surface coat is used to do the same thing as polyester tooling gel coat, which puts a hard surface on the face of your mold. One is used with epoxy and the other is used with polyester resin.

For myself, I find that working with epoxy is easier than polyester. With polyester resin you start with tooling gel coat and then lay your fiberglass on using a laminating resin. For the last layer, a surface resin is used. Also, I don't like the odor. On the plus side, polyester resin is about 1/2 the cost of epoxy resin.

I like working with epoxy resin, as I find it easier to mix and I also use the same epoxy resin in mold making that I use in the fuselages. There are no extra cans of resin sitting around on the shelves for me to pick the wrong one by mistake.

Q: I have tried different cloth layups for the finished parts. Is the choice of cloth a trial and error sort of process or is there some rule of thumb? I have had good success using 3.2 oz. satin coupled with 4 oz. regular weave cloth. The fuselage I have sent for you to review has been laid up with two full length layers of 3.2 oz. satin, and one full length layer of 4 oz. regular cloth with a strip of 1.7 oz. kevlar running full length both sides. Could I get away with a thinner layer of cloth on the fin side? Right now, on my manual postal scale, this fuselage weighs 4 oz. I hope you can provide an accurate weight for me. I would like this fuselage to be under 3.5 oz. if possible without losing strength.

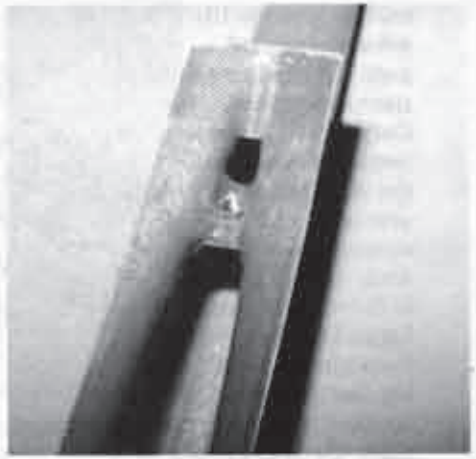
A: There is no rule of thumb on choice of cloth. You will have to go through the trial and error of trying different weights of cloth. Light is better, but is too light worth giving up structural strength?

Synergy III & JR X-388s

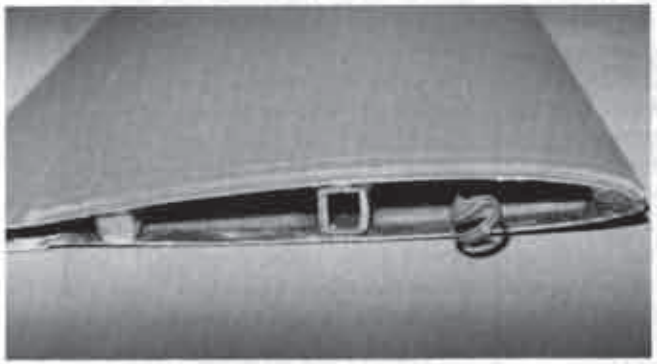
I hate to say how long I had my Synergy III before I took it out of the box, but once it came out of the box it went together in a matter of hours. As I opened and removed the Synergy III parts from the box, the first thing I saw was the epoxy fiberglass, hollow core wing and it's beautiful. (I'm a bit prejudice when it comes to glass work.) The people at RnR Products produce some of the best glass work that you will ever see. As I continued to remove everything from the box I found the assembly manual in the bottom. Reading the manual I found a parts list on page 3, so I took an inventory and all the parts were there per the list.

Where to start? After reading the manual from cover to cover, I then went to page 5 and worked each step through to page 17 just like RnR laid it out in the manual; in a matter of hours the Synergy III was completed. (A couple of hours each night will complete a Synergy III in

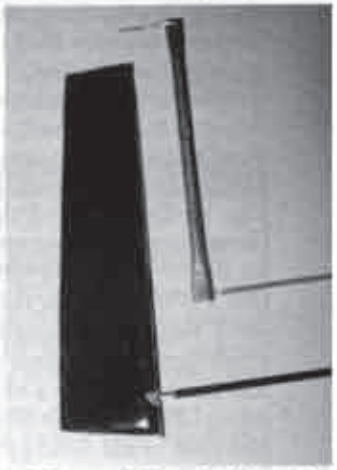
Miscellaneous items included with kit.



Inside of fuselage, wing hold down nut factory installed, stabilizer hold down also installed but not shown.



Wing with joiner and wiring factory installed.



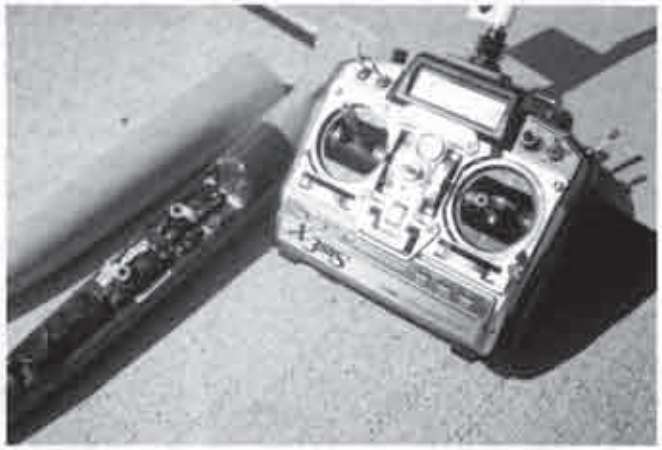
Rudder and elevator bellcrank with push rods already bent at the factory.

Synergy III ready to fly.

about a week.) Because all of the parts on the Synergy III are already built for you, there is only clean up work to do. Only a few tools are needed to complete the job, like a razor saw, razor blades, electric hand drill with a few small drill bits, 2-56 tap, file and sandpaper. Removing the flashing from the fuselage and wing (It's a three piece wing.) is easy; it's just a matter of sitting down and doing it. The hard part is getting up the nerve to cut into the wing to do the flaps and ailerons. I won't take up space by telling you about each step of construction because all of the parts fit and go together very easy. There were no problems, except one item. There is no wood in the kit to build the rudder post, this I had to get from my scrap wood box.

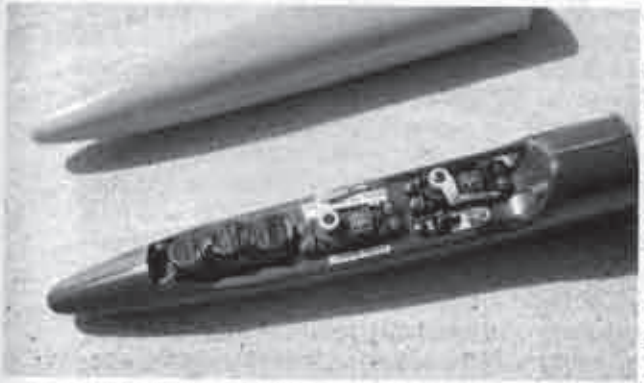
Next step is the installation of the radio, servos and battery pack. 2, JR 901 servos were installed in the fuselage for rudder and elevator control and 4, JR 341's in the wing for the flaps and ailerons. Because I'm using six servos I want the biggest battery pack that I can fit into the fuselage. After a bit of cutting and filing I did get a 1000ma battery pack into the nose of the Synergy. The next step was to balance the Synergy, but because of the size of my battery pack there was only enough room for 3 oz. of lead shot in the nose and I needed more. Using a hammer and file I forged a 4 oz. fishing weight to shape to slip down inside beside the battery pack and fuselage sides, plus a little bit more.

Once balanced the controls were set up using my new JR X-388s radio. Programming is quite easy as the new manual is put together very well. Don't let the size, 186 pages, scare you off. Pages 68-127 are used for gliders. Before I connected any of the push rods, there were a couple of things to do. Already having a full charge on the transmitter and receiver batteries it was time to set up the transmitter controls. Starting on page 78-79 I selected the name and type of my model. Because I'm using four servos in the wing, I worked my way up to page 82 for accessing the dual flap mixing function and set DUA-F ACT. Next step was the easy one: page 89 reverse switching. The servos were checked to see if they moved in the correct direction. Page 90 shows sub-trim adjustments: I centered each servo. Next, I connected and adjusted each push rod. Working the controls, rudder, elevator and ailerons all worked smooth with no binding.



JR X-388s radio

Transmitter in hand, Synergy under my arm, let's go flying! The bag is by TUCK N FLY.



1000ma battery pack, JR 901 servos and switch

I moved on to the fun stuff of a computer radio, page 109, A,B,C and D mixing. Using A mix, turn on SW-A and install 1-2 (spoiler stick and right aileron) and 1-5 (left aileron), step on to B mix, again turn SW-B on, install 1-6 (left flap), and 1-7 (right flap). Moving the spoiler stick, I now had full trailing camber control. For coupled rudder and ailerons, step down to mix D, turn on SW-D, install 2-4. To activate this control the switch is on the top/back right side of transmitter. Crow mix, page 104, is also easy to set up. Step over to MIX-SP. I set my elevator at 30% down, ailerons 30% up and flaps at 80% down. The Crow switch is top/front left side of transmitter.

It's now time to fly the Synergy III. First flights with a new model and a new radio make me a bit nervous, so I asked Gordon Jones to do the first hand toss of this 95 oz. model. With the first hand toss the model proved to be a bit nose heavy. By adjusting the nose weight, the next toss was better. It was time to fly. What can I say? The Synergy III flies like it is on a rail, and the JR X-388s radio works great!

Although I only have one day of flying on the Synergy and JR X388s radio, I will add elevator to flap mixing, next. There is one more switch on the front of the transmitter that I'm not using at this time, but it will be turned on very soon. It will use Mix E & F; it's a pre-set switch marked launch and reflex, flap to elevator and elevator to flap mix. As I get more flying time on these units I will be working on the adjustments for Dual Rates and Exponentials.

Do I have any likes or dislikes? Yes. Why didn't I build my Synergy III sooner! And there was that piece of wood for the rudder post. Also, I'm going to change the ball joint on the elevator control horn to a Kwik link type connector. And why didn't JR come out with the X-388s sooner? ■

Understanding Sailplanes

...By Martin Simons

13 Loch Street, Stepney,
South Australia 5069

Flying in Wind and Weather
A theory of convective cells

The original model of a thermal as a vortex ring is certainly oversimplified, but it is capable of adaptation and elaboration to fit most of the experiences that soaring pilots have in practice. This is not by any means to say that all the answers are known. Thermals are probably much more complex in structure than suggested here, and more complex than the best theoretical models of them so far produced. Research goes on.

Some years ago an elaborate project, organised by Eric Webb of the Australian Commonwealth Scientific and Industrial Research Organisation, was carried out to try to discover how thermals are formed in the lowest levels of the atmosphere. To remove as many interfering factors as possible, a site where the ground was almost flat with few variations of surface to create differences of temperature, was chosen near Hay in New South Wales. (It is interesting that the Hay region is not dissimilar to that around Jerilderie about 100 km to the south east, where a large L.S.F. model soaring contest is held annually.) Instruments were set up in an array on the ground to measure and record small temperature fluctuations and local wind changes over as wide an area as possible, and a number of (full-sized) sailplanes were flown overhead to report, by radio, on thermal conditions as the measurements were being taken below.

The resulting theoretical model is sketched roughly in Figure 35. Over such a featureless plain, in the absence of any particularly noticeable localised heat sources, a system of roughly hexagonal convection cells seems to form, this being the most efficient way of transferring heat from the lower levels to the upper air. Rather than a series of rising columns in the centres of the cells, however, the warm air seems to rise around the edges of each cell, forming a network of thermal 'walls', while in the centre of each cell is the inevitable downcurrent. Within a cell, the air flow over the ground thus would be generally from the middle outwards, and then up on meeting air coming in the other direction from the neighbouring cell. Where the 'walls' join at the corners of the cells, forming convergent nodes, the glider pilots above reported the strongest lift and here, too, dust might start to rise.

It was further surmised that in a wind, the whole cell system became elongated in the upwind - downwind direction, taking the form sketched in Figure 36. This would tend, as shown, to align the

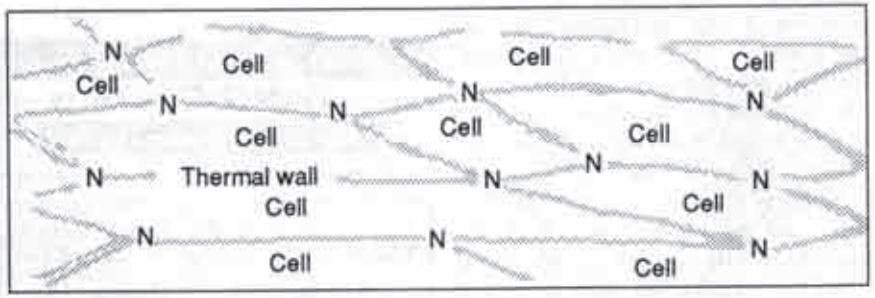


Figure 36 How thermals near the ground may be organised, according to the Webb theory

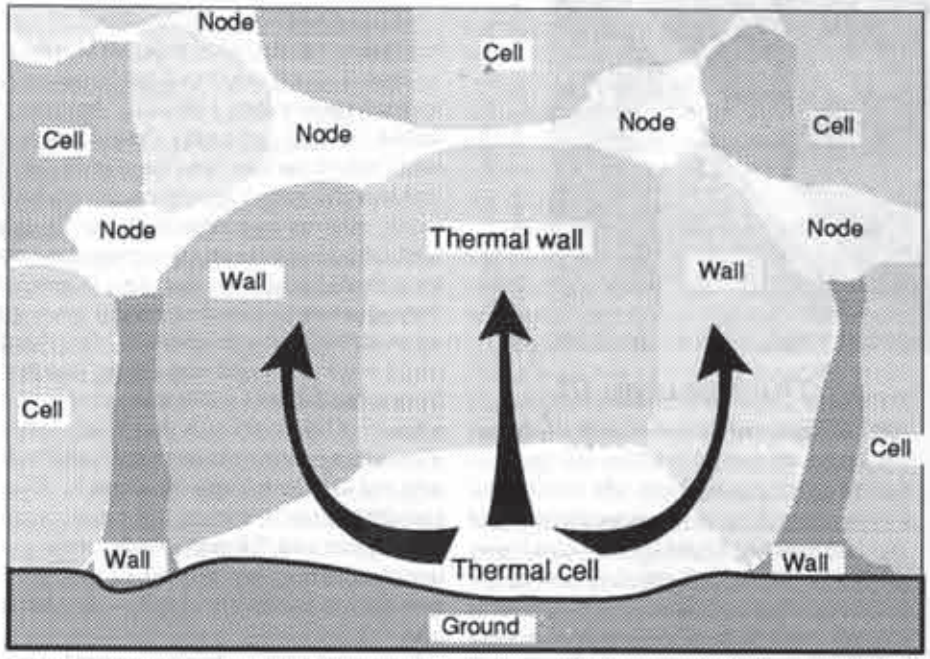


Figure 35 Webb's model of thermal convection near the ground. A system of walls and cells

nodal points with 'streets' of weak lift connecting them. Such conditions would create circumstances where a model sailplane might fly for a long period, moving from node to node along the 'walls' and gaining, or at least maintaining, height. Another model, launched in the centre of a cell between walls, would encounter nothing but sink but might find the 'wall' by flying across the wind for some distance.

Eric Webb's theory remains controversial and a little further research of this kind needs to be done to check it. It should, however, surprise no-one that some kind of cellular pattern arises when there is nothing to disrupt it. Regular cell-like convective structures in liquids have often been demonstrated in the laboratory and satellite photographs of cloud patterns in the atmosphere tend to confirm that thermals do often arrange themselves in regular patterns of this kind. Whether more study will be done by the Australian C.S.I.R.O. into this matter is doubtful. Model gliders, or electrically powered sailplanes, however, might be used to explore the air at low levels to see if the 'wall and node' system does appear. ■

Richard Tiltman (L) & Steve Condon at F3B Team Selection Finals.

The Synergy III

My All-Around Favorite Sailplane

...by Steve Condon
San Diego, California

I remember about three years ago my dad showed me a line drawing three-view from the South Bay Soaring Society newsletter of this new glider that was coming out. It was designed by Rich Spicer and was called the Synergy III. I was immediately intrigued by the model for several reasons. First, I really like the name. The word Synergy is something I had always used with respect to leadership and business; quite simply meaning that "the whole is greater than the sum of its parts". I've always liked that, and I figured that anybody who named a sailplane with that in mind must have designed a winner.

Secondly, I loved the elliptical or "parabolic" planform on the wing and tail. It just looked good. Period. Finally, I liked the fact that it was all composite construction and molded of fiberglass, Rohacell and carbon fiber. I figured it must be exceptionally strong and able to take any kind of stress I could give it. I wanted one.

My dad told me he thought that the three of us (he, my twin brother and I) could go in on one together since it was so expensive — $525.00 at that time. That meant sharing it. Who's garage would we keep it in? Who got to fly it first? What if someone crashed it? I remember thinking that I'd rather have one of my own and let the two of them watch me fly it. Selfish, but true.

At this time I barely knew what F3B was, but I knew it had a speed task in it so it must be cool. I also figured that the Synergy III had to be pretty fast. I like fast. Anyway, I talked my dad out of the three view so I could take it back to San Diego with me. I had that drawing hanging on my wall for many months just admiring the design while thinking how much money that was for a model airplane. But, hey, it was an "introductory" price that would soon go up to $650. I thought about the fact that I could *never ever* build something like that from scratch, how I really wanted one, and a bunch of other rationale that finally led to me reaching for the phone to call RnR Products and ask them a little bit about it. After spending some time on the phone with both Spicer and Tiltman — who were patient answering my myriad of questions over the course of several calls — I ordered one.

Four weeks later, a big box arrived at my office and I immediately opened it up and pulled out one of the wing tip panels. All of my co-workers were saying, "What's that?" I enthusiastically exclaimed, "My Synergy III, of course!" as I marveled at the beautiful molding work and tried to explain what it was. They didn't get it and I couldn't concentrate for the rest of the day.

Building the Synergy III was a whole different experience than the kinds of planes I was used to building. It took me a bit longer to build than I originally thought it would because as I got into it, I decided to take my sweet time so I could *get it right the first time*. On many occasions I read the instructions several times, carefully thinking through the operation before proceeding. In fact, one thing I noticed about assembling the Synergy, and have come to find with all high performance sailplanes, is that the tolerances are very narrow and everything has to be "dead nuts" to work properly.

My advice to anyone building a high-performance ship of this type is to take your time and "get it right". Things like zero-slop linkages, rock solid pushrod installation, perfect surface centering and a true overall alignment of the aircraft are absolutely critical to reach full performance potential. If you don't get it right the first time, rip it out and do it again — you'll be glad in the long run.

A number of the innovations and techniques used on the Synergy III make it exceptionally clean aerodynamically. The skin hinges on the ailerons and elevators coupled with the clean flap gap seals and minimal external linkages make it a very efficient airplane.

My very favorite part about the Synergy III is flying it. Period. I'll never forget the very first hand toss. I had my brother run with it and give it a stiff throw straight ahead into a headwind of about 5-7 mph. The huge park we were flying in suddenly became very small as the L/D characteristics of the Synergy III shined for the first time covering about 200 yards of grass before I applied the flaps to bring her down. It was perfectly trimmed right out of the box.

The next flight was off a winch and that too was spectacular for me. This was the first plane I had ever owned that was strong enough to do a real zoom launch. The first launch was progressing so well that I decided to try zooming it. Although I didn't really know what the hell I was doing, I had seen lots of people do it, you just do a power dive and pull up! Wow, was that fun. Best launch I ever did.

On my first flight, the only objective was to get the feel of how it handled and make sure the trim was right. On one leg of what was basically a big search pattern I got that familiar bump on one of the wing tips and decided it was time to see how she thermalled. The SD 2048 airfoil has a lot of great performance characteristics, but I think that the thermalling ability and climb rate is one of the best attributes.

After working that air to a nice altitude my slope soaring attitude took over and I decided to see just how fast and aerobatic this thing was. Holy smoke! The group shootin' the breeze in the pit area most certainly woke-up when it came screaming by about 30' off the deck following a dive from about 500'. The energy retention is really outstanding. At the time, its performance reminded me of the way my quarter scale model would handle at a good day on the slope.

On what was basically the final approach for one of the first flights, I flew through a little bubble of air about 25-30' above the winch turnarounds. I started circling, hoping to go out on it. The air turned out to be only a bubble not allowing me to get much higher than around 40'. What absolutely impressed me and all of the onlookers was the way she could ride that bump all the way down the field like a hand launch model without ever tip stalling or sinking out. I was hooked on this airplane.

I have now been flying the Synergy III since June of 1990 and have gotten to know the airplane real well. One of my favorite things to do is go out to Torrey Pines on a "pumping" (and hopefully uncrowded) weekday, throw three or so pounds of ballast in it and just haul XXX.

Although I hadn't really intended to get into F3B with the Synergy, I was intrigued with what it was all about. I remember going up to see the 1991 F3B team of Jolly, Perkins and Wurts practice at the SULA field one weekend. I thought it was real neat, but I didn't give much thought to participating seriously. Quite frankly, it looked like a real good way to beat the daylights out of an airplane, and I wasn't so keen about doing that to "my baby".

All that changed when my friend, Manny Tau, was telling me about practicing with the US team in the summer of '92 for the 1993 US F3B team selection finals. He suggested that I come up to LA and give it a try. Sounded fun, so I decided to give it a whirl and see if I could qualify for the finals.

My first chance came on July 18, 1992 at an F3B contest at SULA. I had never launched my Synergy off monofilament line and was really looking forward to it. I couldn't believe the amount of altitude I

could gain after the zoom! I guess I was immediately spoiled, my launch was so much higher than I was used to getting, that I managed to out last Manny and Randy Spencer in the (dead air) duration task to take the 1000 points. The next two tasks were what had me wondering — distance and speed. I had to do a minimum of 16 laps in distance and a sub 24 second speed run.

When doing the distance task, it reminded me very much of the style of flying on a slope in light air. I was in very good lift and had Seth Dawson coaching me and calling my turns. The lift at the upwind end was so nice that as I pumped the Synergy through the upwind turn I was gaining altitude on each lap. I ended up doing 24 laps easily achieving the requisite 16 needed to qualify. I then learned that my opponents had only done 8 and 20 laps respectively. The Synergy III killed 'em. Later Daryl Perkins referred to my Synergy III as "a distance machine that's tough to beat". I most definitely agree.

The speed run was the thing I was really looking forward to. (To be quite honest, I basically live for speed.) Two pounds of ballast was what was recommended since everyone said this was "slow air"... whatever that meant. At the time I didn't appreciate the *major* difference between speed runs when there's "dead air" and when there's "air on course". My first speed run was a 23.1 which was not the fastest of the day, but it was enough to qualify! I was real happy.

At the end of the first round, the score keeper came over to me to let me know the standings — I was leading the contest. We only flew one official round, so I was declared the winner.

Now the education began. I had no idea what was necessary to get ready for the team selection finals until I qualified. After lots of phone calls to find out all I needed and to borrow some of the equipment, I was on my way. Thanks to Rich Spicer for letting me borrow his F3B winch. I teamed-up with Manny Tau and Gavin Botha to form the Southern California Team, later dubbed "Lo-Cal". I think that name evolved since Gavin is from No. Cal and we were pretty "low key" compared to all the other heavy hitting teams at the finals. We were all F3B rookies when it came to competition at this level.

Fortunately, Richard Tiltman of RnR Products was persuaded to be our primary team helper. This guy is no rookie, having been to the Worlds twice as a helper. Richard really kept us together and made sure we didn't have to think about anything but flying. Aaron Valdes provided invaluable "grunt work" support on the turnarounds. By the end of the first day at the finals we had worked out some bugs and our team was working very well together. In fact, we were having a lot of fun!

After three days of intense competition, I was hooked on F3B. Risking "my baby" was no longer a concern. My attitude took a shift to, "If it gets broken, I'll fix it or replace it. Money and time are no object; I must fly F3B!" Many of you may have experienced that feeling after trying F3B. Joe Wurts told me that the secret to doing well at F3B is consistency. It obviously works for him and it also proved to work reasonably well for me as I flew my way to ninth place overall.

Larry Jolly told me at a practice before the finals that the exact airplane you fly isn't the most important thing — what is important is that you know it well. That was a key factor to my success. I love to fly my Synergy III and the hundreds of hours of sport flying and AMA contests with it made the transition to F3B very easy. After the finals I started slope racing my Synergy III on the light air days not suitable for my Nova. I found it to be extremely competitive and even took third place at the CSR State Championships with it. The Synergy III really is a great airplane for <u>all</u> conditions.

For sport thermal and slope soaring, or competition for thermal, F3B, or slope racing the Synergy III is fiercely competitive in all arenas. Quite simply, that's why it's my favorite all-around airplane. ■

Golf Repair Applications for Sailplanes

...by Edwin Wilson
Louisville, Kentucky

I have been a modeler for over thirty years and for most of those years I have been a golfer of some very questionable skills. Just three years ago I took some classes on golf club assembly and repair and ever since this has become a second hobby of mine. The outcrop of this has been the discovery of some products used in golf club repair that have some applications to our models.

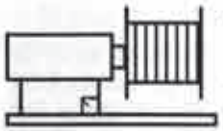
One of the best and most useful items I have found is "powder lead". Looking more like a fine grain sand than a talc powder lead in the nose of a glider, it is more dense (smaller air gaps) than bird shot and a lot safer to use than melting lead with its dangerous fumes and possible burns. Thin CA will make the powder lead become a solid lump, and costing less than four dollars a pound it is an alternative to bird shot or recycled wheel weights.

Flying buddy, Jay Burkart, is using this lead. When balancing a plane he puts what he thinks he will need to balance his plane in a zip top sandwich bag. Adding and subtracting lead from the bag until he is close, Jay static balances his plane. Standing the plane on its nose, he pours the lead from the bag into the plane's nose. On top of the lead he adds a layer of thick CA until he forms a bulkhead which will hold the lead in place. As he flight trims his plane, Jay removes lead through a small hole drilled in the CA bulkhead. When he is satisfied with the plane's balance, thin CA is put in the bulkhead hole to solidify the powder lead and prevent a mess, or possible crash, in case the CA bulkhead should break allowing the lead to flow back to the plane's tail.

String whipping used on some golf woods is a plastic coated braided line. Uses in models would include spoiler cables or pull pull control surface strings in small planes. A small spool would last for years.

There are color dyes available to add to epoxy for those wanting to glass their own wings or fuselages with the color pre-built in.

The yellow pages under golf repair is the first place to look as a source for the lead. Most areas of the country have specialty repair shops or a golf pro can lead you to a source. Component distributors can be found in the classified area in the back of most major golf magazines. The major ones are Dynacraft, Golfworks, and Golfsmith. All have 800 numbers and free catalogs. ■



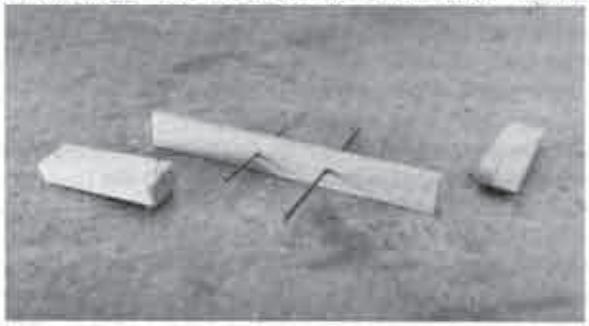
Winch Line ...by Gordon Jones

Gordon Jones, 214 Sunflower Drive, Garland, Texas 75041; (214) 840-8116 After 5:00 P.M. CST

Easy Stabs

A short time back I wrote an article on the Shadow 118 from TEKOA. One of the things that I really liked about building the Shadow was the construction of the stabs. They were easy to build and very strong; both points that I like in any building project. After looking at another scratch building project and deciding on wing, fuse, etc., I decided to use the same construction technique for the stabs on this plane, as well.

The basic idea here is to cut troughs in the foam along the joiner tube lines. Next put in a little spackling in the troughs to fill the bottom under the brass tubes. Then put the brass tubes in the troughs with the joiner rods in the tubes and the bellcrank in the middle to insure alignment. Once the alignments is to your liking, fill the remainder of the troughs with spackle and let dry. When the spackle is dry sand the spackle down to the core and sheet in the normal fashion. Pretty simple, huh!



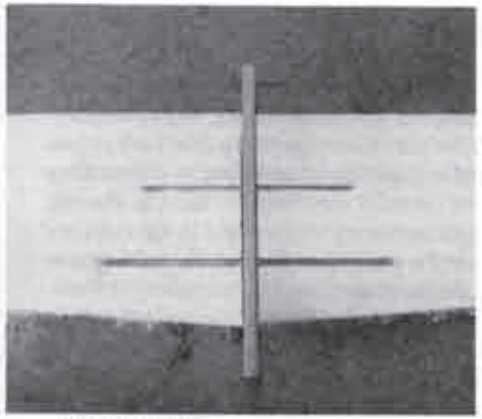
Simple Tools

As most of the stabs that I build are generally the same size with the variation usually the length to compensate for the wing area, I decided to fine tune the process with a couple of custom foam cutters and a jig for the joiner alignment. You can even make a standard set of plans with all the dimensions to go by for each new set of stabs. If you use the same, or like, bellcranks every time this makes the whole process go a lot quicker. And as most of us will agree, we all want to see our projects completed last week and these tools speed construction.

The custom foam cutters are quick to make and take about 30 minutes to complete. First measure the depth of the centerline as measured from the top of the stab at the location of the joiner tubes as marked on the core. Next select a small block that fits in your hand but not be too large. Select some foam cutting wire about four inches long and get out the smallest pair of needle nose pliers you can find. Bend the wire in a "U" shape so that it is the same size as the brass tube for that particular slot. Don't make it too big as small is better (less fill).

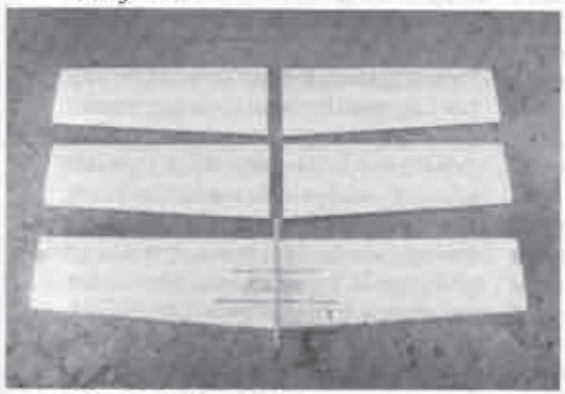
Next mark the separation of the wire on the end of the wood block. Use a VERY small saw blade or saw to notch the end of the block. You may need to use a small triangular file to open up the slots to fit the wire; but try not to make the slots too wide or the wire will move around. Find a small piece of scrap wood to make an end for the block. Cut the scrap piece to fit the end of the block so that there is no overhang. Place the wire into the slots; then measure the distance to the bottom of the block to the end of the loop in the wire. When the distance is correct put a little CA on the scrap and place it on the end of the block to hold the wire in place.

Next bend the single strands of wire that are protruding from the block over at about a 45 degree angle away from the center of the block. Curl the end of each wire so that you can easily attach an alligator clamp for the power hook up, and you are done. Repeat this process for the other mini cutter and this phase is complete. See it didn't take that long at all.



Ready to Fill

The jig for the joiner alignment is even easier than the mini cutters. As I use the same size stabs in most instances I measured the distance to the centerline from the work table. This gives a base measurement for the center line of the jig. Use a piece of plywood about six inches long and about 1/4" or 3/16" thick. This gives plenty of meat to hold the alignment wires without moving around a great deal. First square the plywood so that you have a flat surface from which to measure. Measure up from the bottom of the plywood the distance from the work table to the centerline and then mark a line the length of the plywood.



Mass Production Made Easy

Next mark the location of the alignment wires on the line that has been drawn on the plywood. Leave some extra wood protruding from the ends of the foam cores. With the alignment wire locations marked, select a drill the size of the wire and drill wire locations in the plywood. Slide the joiner wires in the plywood and make sure they are perpendicular to the plywood and equidistant at each end. When you are satisfied CA the wires in place. When the CA is dry recheck the alignment of the wires. Guess what; we are done again.

The Completed Product

These two tools have made production of stabs a snap and they don't take long to make so it is worth the effort to insure alignment and an easy tube installation every time. Small tools and jigs like these are generally simple to build and save many hours holding and clamping pieces together all the time. If you have any specialty tools or ideas please let us know as someone else could really use them. ■

European Chronicles

...by Marc Dufresne
© Copyright 1993
Domaine de Belle Croix 17,
rue Albert Camus 77330
OZOIR-La-Ferriere, France
Tel/FAX: +33 1.64.40.12.24

Fog? What fog?!?

WEEEEEEEEEGNAAAAAAAAAAAAAA

I almost jumped out of my skin. I had just been passed by a motorcyclist doing at least 130 Kph... In the fog.

Now this fog is serious stuff. I've lived 10 years in New England and we got fog from time to time but this was something else. "This is not bad," one co-worker had commented earlier in the day. "Sometimes it gets to the point you can't see beyond the hood of the car". On that day, not bad meant that I could barely see 20 metres ahead. Everyone drives with their lights on and this includes fog lamps.

Ah yes, fog lamps. They are standard equipment in this part of the world. I chuckled some when I saw that my car was equipped with fog lamps FRONT and BACK. This I had to check out. So, I walk around to the back of the car; two, count 'em, very bright red lights. For a moment, I thought that the brake lights were on. Nope, those were fog lights. Same thing out front, but they are yellow and low down. The car is now a fair imitation of a Christmas tree. It's meant to be a security feature! Ah! This IS France...

Now, you'd think that with this type of weather, that traffic would slow down. Well, not really. Everyone turns on the fog lamps and just keep going. The rear red light are visible at least 100 metres back. So, it's follow the leader and 3/4 ahead full. Except for those crazy motorcyclists...

So, I'm on my way to the a club meeting, in the fog. It's about 8 PM and it's dark. I'm in the right hand lane, doing 80-90 Kph and trying to read the road signs, most of which are posted 5 metres off the ground. It's tricky; you don't get much warning and then they are not lit very long as the fog absorbs the light very efficiently. I'm the dummy in the lot, as everyone else is passing me, doing about 110.

This club, Areo Club Les Cigognes (STORKS), was recommended to me by Mr. Maisse, President of the EOLE Association. EOLE's mission is to foster and support RC glider activities in France. It also organizes all the sanctioned glider contests on behalf of the FFAM, the French Aeromodeling Federation. AC Les Cigognes has an interesting history. It started as a real Aero Club (with full size planes) in the early 30s. It included a "cadet" section focused on modeling. The flying activities were suspended during the war. After the war, things got going again, but gradually, the modeling section took on more importance, especially as RC became more popular and affordable. Eventually, all full size flying was stopped and the club is now a modeling club only.

Les Cigognes is located about 30 Km south of Paris and lays claim to the "best flying field in the region": the Air Force Flight Evaluation Center in nearby Bretigny. Access is limited to days when the center is not in operation, which means weekends and holidays. They operate two flight lines: one for powered craft and the other for gliders, each with an assigned set of frequencies. Since towing is quite popular in France (This is the country the got the F3I class going.), there is a special rule that if a glider is being towed from a particular flight line, both craft must operate on that flight line's set of frequencies. The club has about 150 members, split about 60/40 in favour of power. Most of the glider flyers are F3B oriented.

Club meetings are held every Tuesday, starting around 9 PM in a permanently assigned room at the local civic center. There is an interesting cultural note: the club operates a small bar/cafe in its room as no self-serving Frenchman would dream of meeting friends for any length of time without consuming something. French cafes are notorious for this; you go in with a group of friends, order coffee or whatever and you can chat all day if you want. Nobody will ever bother you. You don't even get a check unless you ask for it. The club operates on the same principle; walk-in, get something to drink, sit down with friends and talk away. That night, the guy responsible for the bar was absent — grumbling was heard.

The group was pretty typical as modelers go, some showing up with their latest creation, others discussing particular technical points or otherwise. I linked with a number of members who were focused on gliders. I'd brought the ANTHEM plans along to get comments and advice, especially on radio gear. I got whistles of admiration on the bullet proof spar and chuckles at the "clam shell" fuse. The ANTHEM was immediately classified as an F3B-class "gas-works" machine. (Note: The term "gas works" is commonly used here to refer to a complex set-up that requires a lot of attention or tuning to get it working right. The equivalent American expression would be "bells and whistles".)

This led to a discussion about what radio would be best suited for it. I also pointed out that I had additional gliders that required similar functionality. The GRAUPNER MC-20 or the MULTIPLEX 3030 were recommended with the comment that the GRAUPNER had better price/performance. These are both top of the line gear and we are talking serious money here.

While on the subject, it seems that everyone here gets two sets of crystals. In fact, crystals are sold separately from the set. One guy mentioned that he had to wait 3 MONTHS for delivery of a 72MHz set. Hummmm. Also, you must get a license from the French PTT for your transmitter. The license is valid for three years, allows you to own three transmitters and costs 170 FF ($30 USD). Club rule: fly without a license and you get turfed out of the club. You must have the license with you at the field.

I was given a very detailed new club member package that includes the club charter, its rules, a plan showing the location of the flying site, a list of upcoming club events and finally a schedule of membership fees. I had to sit down to digest that last item.

Now, to put this in context, I used to belong to a very small club near the Mass/Rhode Island border. Our flying site was on a member's land in a flood plane along a river. Our biggest cost was the mowing fee for the field. Dues ran about $20 a year. What I now had in my hands was "sticker shocking". First there was a 320 FF ($60 USD) initiation fee, and then a 430 FF ($80 USD) yearly dues. GULP. Upon inquiry, it turned out this was a bargain. First, the yearly dues includes the FFAM membership. (Joining a club is the only way you can get to join the FFAM.) Also, participation in sanctioned contests organised by the club is free to members. Non-members pay. Entry fees in contests organised by other clubs are reimbursed to members that participate in them.

The club also subscribes to a number of modeling magazines and buys plans (all kept neatly in a closet). It also has fuselage molds for the entreprising modeler that wants to scratch build his own fuselage. Time ran out on me to have a closer look at what was available.

This certainly is very different from what I had known stateside. There was a strong sense of purpose and camaraderie. Pride also. The club also operated a purchase co-op that provides members with reduced prices on certain modeling

materials. Also, many hobby shops will give a discount when presented with the club membership card. From what I can gather, the local hobby shop is still the main source for kits and supplies. I haven't heard of or seen advertising for an equivalent to TOWER HOBBIES here in Europe.

Sidebar to all this: the club rules call for every member to contribute eight hours a month to club activities. Not enforced as much as in the days when full sized craft were the mainstay of activities, but still... The intent is that everyone is expected to pitch in to help with club activities, including contests.

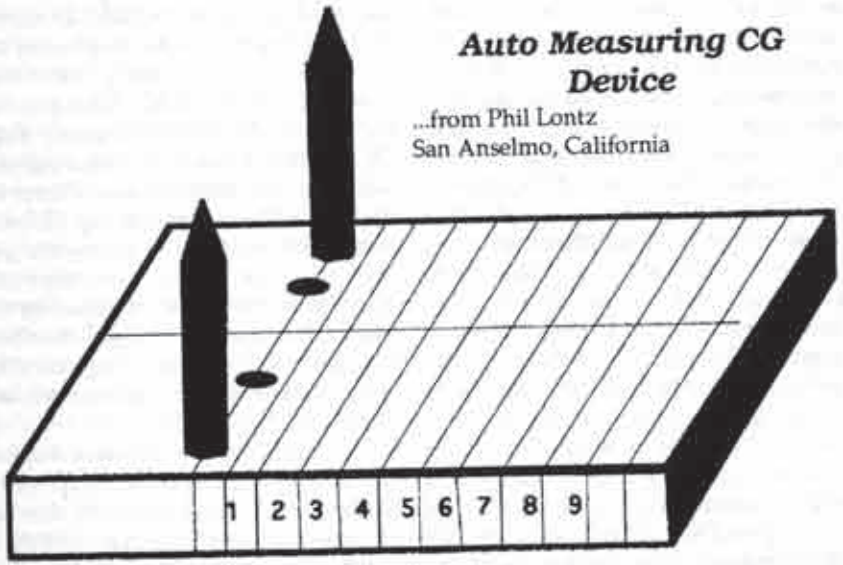
The next step now is to get my workshop set up, get my hands on some radio gear and go flying. The flying season gets underway in earnest in April. Between F3B, F3I, F3J and F3F, I could be out there non-stop 'til the end of the year! There is an international circuit for all these classes also, so one can be on the road virtually non-stop. A great way (for me) to discover Europe and to use up all this vacation time that was foisted on me (about 7 weeks total, counting holidays).

I also plan to attend the Paris Modeling Show coming in early April. It covers every aspect of modeling: trains, boats, planes, etc.... And it runs for a week.

Continued next month. ■

Auto Measuring CG Device

...from Phil Lontz
San Anselmo, California



WRAP GRID PAPER ON TOP AND SIDES FOR EZ ALIGNMENT OF SHIP. MAKE ANY SIZE FOR ANY SHIP. DRILL EXTRA HOLES TO ADJUST FOR FUSE WIDTH. MAKE DEVICE LONGER THAN SHOWN TO EASE FUSE ALIGNMENT. BLUNT THE ENDS OF BALANCE STICKS.

Bent Is Best

...by Jef Raskin
Pacifica, California

Like Simons (On Not Being Strictly Neutral, *R/C Soaring Digest*, July 1992), I read Deis' three-part article on CG, Elevator Trim, and Decalage with interest. Simons pointed out that the trimming method advocated by Deis (*R/C Soaring Digest*, March 1992) and many others in the flying fraternity cannot really work quite as described, and I think that Simons' point is well taken. A flyable sailplane has some positive pitch stability, and the stabilizer is usually supplying a small downward force. But this brings up another point not mentioned by Simons in his associated discussion about reducing drag from the tail surfaces.

Deis noted that if "the sailplane has a stabilizer/elevator configuration, there is another step to perform. After passing the dive test, check to see if the elevator is parallel to the stabilizer. If it is not, adjust the decalage angle by shimming the wing or stabilizer [and repeat the test] until the elevator and the stabilizer are parallel when you pass the dive test. It is very important to go through this last step because it minimizes the drag generated by the stabilizer..." It is commonly accepted that keeping the elevator and stabilizer parallel minimizes drag. However, this is not true unless the plane does not have positive pitch stability and the stabilizer is generating no force at all (which Simons showed undesirable from both a controllability and a drag perspective).

Except for aerobatic models, we don't use wings with symmetrical airfoils on our sailplanes for the simple reason that a cambered airfoil can achieve a better lift to drag ratio than one with a straight meanline. This is also true for stabilizers and elevators, even when implemented as a "flat plate" slab of wood. A slight bit of "up elevator" to camber an otherwise symmetrical surface for producing the small downward force is actually more efficient than tilting the entire surface to achieve the same effect. The camber necessary only amounts to a few percent of the chord; a 10 cm chord stabilizer and elevator will only have the trailing edge up from the neutral position by 2 to 5 mm in level flight. This is why, in an arena where profits depend on efficiency, namely transport aircraft, the stabilizer invariably has negative camber just as the wings have positive camber. Go look at a DC-10 or 747 if you doubt this.

Fliers who insist on building their planes so that their symmetrical section elevator and stab are in the same straight line when trimmed for best L/D are not losing much, but they are losing something. To paraphrase an old saying: He who flies bent flies best. ■

LIFT OFF!

...with Ed Siegers
Route 15
Wharton, New Jersey 07885
(201) 366-0880 - FAX (201) 366-0549
8:30 AM - 5:30 PM (Closed Sun. & Mon.)

Custom Made Battery Packs

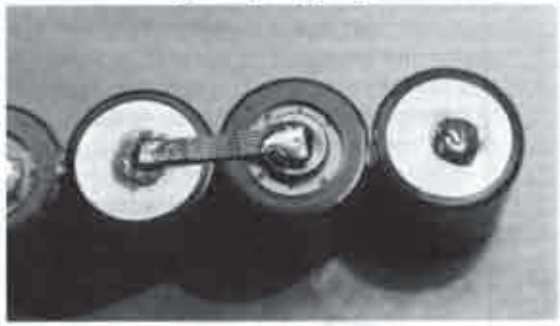
In most of the commercially available electric planes and in most of the sailplanes that are converted into electric, a standard shaped battery pack that is manufactured by the battery manufacturers will fit. There are occasions where this is not always possible. For example, a glider with a long narrow fuselage may require a custom made pack. There are also some modelers who I have talked to that would like to make their own packs just for the experience, but are afraid to.

Making battery packs for some people seems to be one of those things that the modeler thinks can only be done by a manufacturer and that making a battery pack is too difficult for the home modeler. This is not the case. Once you try to construct your own battery pack and see how easy it really is, you'll wonder why you didn't try it sooner.

There are a few tools and parts that you will need. One is a good soldering iron. I use an adjustable soldering iron, but any iron of 40 watts or more will do just fine. Secondly, you will need some rosin core solder and a small container of flux. Thirdly, you will need a wire stripper and some heat shrink tubing the size of the cells you are working with. If you are using battery cells without the tabs, you will also need some braided cable which is available at most electronic supply houses.

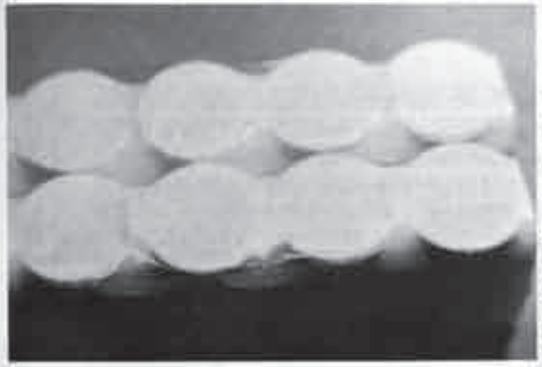
Batteries are available two ways: one with tabs and one without tabs. With a little care, either will work fine. Up until now, the reason I did not like batteries with tabs is that both tabs faced the same way, making it very difficult to get a good and dependable connection between the cells. RJL control systems has recently acquired Sanyo 1000ma batteries with the tabs going in the opposite direction making it much more convenient to construct a battery pack.

In constructing a pack, the first thing I do is to lay all the batteries down on a flat surface with the + and - opposite each other. I then place a drop of CA glue between each cell. This makes handling and working on the pack much easier. Next, take a small piece of sandpaper and rough up the ends of the battery and then clean the ends with alcohol. Next, heat the end of the cell with the soldering iron and, with the solder dipped in flux, put a small bead of solder on the end of the cell. Place the soldering iron on the cell only long enough to get a good bead

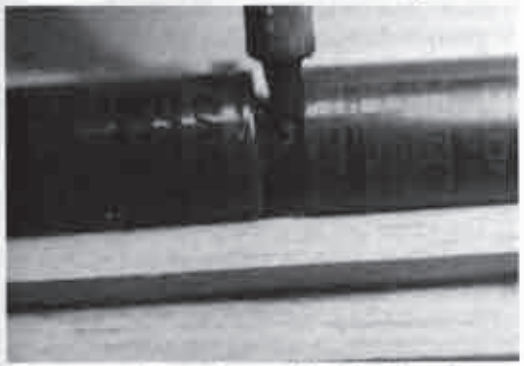


Bead of solder & braided cable

Solder tabs



Pack in heat shrink tubing



Batteries are soldered end to end

to adhere. The idea here is not to let too much heat get absorbed into the cell which could do internal damage to the battery. This is why a small pencil type soldering iron doesn't do well; it takes too long to get a good solder joint. Next, take a small piece of braided cable and connect the + and - between each cell. Then, solder your battery wires and connectors of your choice to the pack. The last thing is to put heat shrink tubing around the entire pack and shrink with a hot air gun.

I think the pictures will help and I've also listed the manufacturers of pre-assembled battery packs and the dealers that handle individual cells and heat shrink tubing that I have found to be reliable.

Battery Packs: S. R. Batteries, Inc., Box 287, Bellport, NY 11713; (516) 286-0079

Cells: TNR Technical Inc., 279 Douglas Ave., Altamonte Springs, FL 32714; (800) 346-0601

Cells & Heat Shrink Tubing: RJL Control Systems, 8 Wetmore Dr., Denville, NJ 07834; (201) 627-7070

★ ★ ★

Have any of you come up with a good/better way to hold wings on without using sticky tape and ruining the beautiful finish of the plane?

Do any of you have a unique way to attach a canopy? I'm looking for some different techniques.

On another note, can anyone out there tell me the origin of the following words: "butterfly" and "crow"? The first person to give me the source will receive a free one year subscription to *RCSD*! ■

Ridge Writer

...by Mike Bamberg

1059 NW Darnielle St.
Hillsboro, Oregon 97124, (503) 640-5926

It's time to write another column and this time there has been so much going on I'm getting a real late start on the writing. Actually, I'm writing this at 11:30 P.M. as well as late in the submission cycle. But on to the fun stuff.

One of the recent activities I've been pursuing has been the attaining of a Certified Flight Instructor rating for full scale power airplanes. This last April 27, 1993 I was able to pass my practical test for this rating and achieve a major dream and goal in my life. The most frustrating part was the waiting through the wettest April on record to get a clear enough day to take the test. It was also the most agonizing test I've ever taken. I'm glad it's over and I can enjoy teaching and getting back to my models.

Aerobatic Contest

This same wet month has really curtailed my model flying. Of three slope events we've attempted in the last few weeks, all have been called on account of persistent rain or lack of visibility (cloud forming on the bluff of the hill).

At our scheduled aerobatic contest we lost one plane due to the sudden forming of a cloud in the middle of the round. The missing plane was painted white and out a little further than the others when the cloud materialized. The plane simply vanished. A hard lesson was learned about flying on marginal days.

We also learned how difficult it is to conduct an aerobatic contest. We had chosen to organize a little differently than Jef Raskin has described in his articles. Our format was as follows:

Divide the pilots into flight groups of 3 or 4.

Have one group act as judges while another group flies.

Have each pilot in the flight group pick a maneuver from a pre-defined set of maneuvers.

Each pilot in a group will lead the group in the maneuver they have chosen.

Each pilot has up to 3 attempts to complete the maneuver but must discard the previous attempts and accept the score for the most recent attempt.

The scores are assigned: 3 points for the best performed maneuver in the group (for that maneuver), 2 points for second best, 1 point for attempted and recognizable, 0 points for not attempted or un-recognizable.

After all pilots and maneuvers have been scored, each pilot's score is totaled and the group is normalized. Highest score gets 3 points, second gets 2, everyone else gets 1 point.

After 3 complete rounds normalized scores are totaled and the top half of the pilots advance to the finals.

The finals are conducted in the same manner but with a more advanced set of maneuvers.

We spent quite a while developing these rules but didn't get to really try them out. We did discover how very difficult it is to get a consensus among the judges due to differences in preferred styles of maneuvers. Some liked large open loops and others tight ones. Some concentrated on precision of entry and exit attitudes and others on heading and smoothness. This was admittedly a very shallow attempt due to the weather but we are looking forward to trying it again soon. If you want to try this format please write me and I will send you a complete copy of the rules and maneuvers. I would also be interested in hearing about your attempts at other formats and judging procedures.

I had hoped to include some pictures in this month's column but the events did not allow. I will have some ready for next time.

Third Annual Celebration of Silent Flight

This next little bit it not really about slope flying but is directly related as you will see. Just last week our club, the Portland Area Sailplane Society, was involved in the third annual Celebration of Silent Flight. It is a joint venture between our club and a local power club to promote soaring and electric powered flight. It has so far always been a lot of fun to attend and fly. This year one of the highlights was some aerobatic flying by a member of our club, Rolf Zurcher. He had designed a very simple, light weight, 4 channel, fun-fly style plane. It used a WAR power 05 type motor on 8 cells and he flew it in a smooth and casual style that really impressed everyone that attended. Flight times were on the order on 7 minutes but he didn't run full power much of the time. He moved from right-side-up to up-side-down as easily as he rolled or looped and with a lightness and smoothness that remind me of an ice dancer. And he does the same thing on the slope with the non-powered version of the same plane. Some of the smoothness is harder to achieve on the slope and vertical maneuvers are often unattainable from the same attitudes and airspeeds, but Rolf is one of the most persistent slopers I know and this demonstration only confirmed my feeling that many of the best pilots that fly models of any kind have refined their skills and reactions on the unlimited flying available on the slope.

Until next time, just keep the wind blowing but please turn off the rain! ■

on the Wing

P.O. Box 975
Olalla, Washington
98359-0975

Hartmut Siegmann's HS 3,0/9,0 and HS 3,4/12,0

The July 1992 issue of *Flug- und Modelltechnik* featured an article by Hartmut Siegmann which described a relatively small light weight swept wing tailless design. Mr. Siegmann's goal was to construct an easily transported model which would be able to perform well in both light slope winds and, with a change of airfoil, flat land thermals.

The result of Mr. Siegmann's work is a constant chord swept 'wing of 20 cm chord (about eight inches) and 1.5 meter wing span. For slope flying, a 3% camber section of 9% thickness is used. This gives sufficient lift with the minimum drag necessary for good penetration. A 12% thick 3.4% camber section is used for thermal flying. Twenty degrees of sweep and a moderate amount of twist is all that's needed to provide stability.

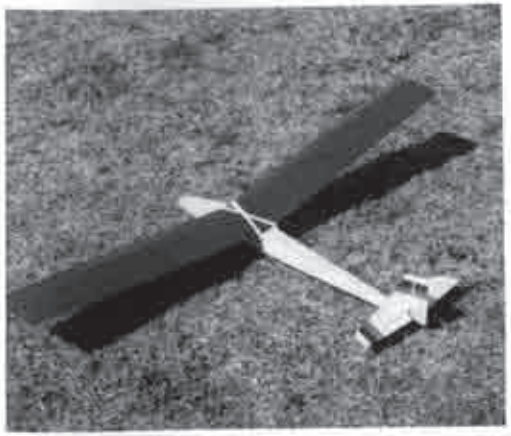
The airframe is built of foam and balsa, while paper packing tape serves as the covering material. (Thin balsa sheeting could be used if a more robust structure is desired.) An aluminum tube serves as the wing joiner, and winglets are glued on with 5 minute epoxy. A streamlined fuselage of sheet balsa completes the 'ship. This is a simple structure which is capable of very good performance. Mr. Siegmann's article included pictures of the completed model flying over the North Sea and in the Alps.

Coordinates for the HS 3,0/9,0 and HS 3,4/12,0 profiles were given in the article. We immediately entered this data into our plotting program, but the HS 3,0/9,0 which was produced showed some obvious flat spots when compared to the HS 3,4/12,0 contour. Some minor manipulations smoothed the profile nicely, and the resulting coordinates for both sections are printed here.

The accompanying chart gives the information you'll need to utilize these sections in your own design. ■

HS 3,0/9,0		HS 3,4/12,0	
X	Y	X	Y
100	0.1	100	0.1
95	0.64	95	0.812
90	1.24	90	1.475
80	2.432	80	2.87
70	3.625	70	4.25
60	4.75	60	5.902
50	5.975	50	7.516
40	7.0	40	8.901
30	7.885	30	9.5
20	7.425	25	9.415
15	6.7	20	9.099
10	5.627	15	8.38
7.5	4.9	10	7.12
5	3.925	7.5	6.271
2.5	2.685	5	5.101
1.25	1.95	2.5	3.448
0	0	1.25	2.351
1.25	-0.975	0	0
2.5	-1.175	1.25	-1.473
5	-1.335	2.5	-1.77
7.5	-1.4	5	-2.102
10	-1.475	7.5	-2.11
15	-1.5	10	-2.2
20	-1.54	15	-2.329
30	-1.685	20	-2.41
40	-1.9	25	-2.498
50	-2.0	30	-2.5
60	-2.0	40	-2.7
70	-1.875	50	-3.085
80	-1.52	60	-3.22
90	-1.04	70	-3.061
95	-0.65	80	-2.392
100	-0.1	90	-1.45
		95	-0.811
		100	-0.1

Section	Camber	Thickness	Zero Lift Angle	Moment
HS 3,0/9,0	3.0%	9.0%	-1.23°	0.00095
HS 3,4/12,0	3.4%	12.0%	-1.23°	-0.00001



Handlaunch Thermal Thing
"Why buy just one?"

...by Barney Bauer
Fenton, Michigan

So, it was late February and I'd just gotten into turbulence downwind of the trees on our side of the lake and performed a magnificent single point landing (translated as: 60 degree nose down) onto the ice. Now, if you're a glider nut native to a warmer part of the country, a Michigan lake is like concrete in the middle of February! Damn! I needed a new practice plane fast!

Late that night, as I pondered weak and weary, I came across an ad for Rol Klingberg's THERMAL THING (Future Flight Inc.) At a total cost of $20.00 each ($16.00 for the plane and $4.00 for shipping), how could I go wrong? I sent for two knowing that if they were typical Future Flight stuff one of my friends would want one immediately. My buddy Don took the second one the day they arrived!

What we found in the boxes was a nice rolled plan which included the building instructions on the plan face, properly selected wood and clean diecutting. Diecutting?!!! Yes, diecutting!! What do you expect for 16 bucks, hand sanded parts? Well, maybe, but anyway, nice stuff! The diecut ribs removed cleanly, stacked and matched each other well, and the whole thing was packed tightly with the requisite hardware etc., etc. There was a little edge crushing of a few ribs but it was minor and popped right out with a quick spray from the water squirter. The point is, everything fit!

Now, I should probably mention that the instructions on the plans are well written but a bit sparse. I wouldn't recommend that you hand this kit to a raw beginner unless you give them a little guidance, but the kit is simple and even a beginner won't need much help. If, like most of us, you've built many, many planes, you can build this one in your sleep! Just don't snore too loud, it'll upset the dog.

The body is a straightforward, 3/32 balsa slab-side using 3/16 sq. inside corner reinforcements, balsa formers and a balsa snout. The forward floor is birch ply. I added two skids (Cause I like em, that's why!), put in a blind nut for a tow hook and cut a hand launch hole behind former #2 after reinforcing it with a matching piece of 1/16 birch ply. Hand launch hole? Did I say that I wanted to make it a handlaunch? Well, maybe we better talk about that!

The wing with its front spars is naturally turbulated. It looked like it should handle well under the low, turbulent conditions of hand launch. Hell, the spars are just like the ones that worked so well on the free flights I flew as a kid. The wings have a "mild" double tapered planform and by leaving off the outer panel the wing becomes a hand-launch-legal 60 inch span. I adjusted the dihedral to 17 degrees total. If I build another one I'll make it 20.

I made a few other minor modifications. Now Roland, if you read this, don't freak! I changed the tip outline of the tail group. I kept the areas the same, just used the kit pieces, cut them off at an angle and put cross grain pieces from scrap at the tips. The original tail outlines are cute but reminded me of my 1936 Dallaire Sportster. Buddy Don is building his per the plan. He's building the 71" version but TRW has him working overtime so his isn't ready yet.

I added a 4-40 blind nut and screw for a hatch retainer. I didn't like the nose area dowel and rubber band suggested on the plan. Speaking of dowels, I strongly recommend reinforcing the area around the wing dowels with fiberglass tape. The rear dowel pulled up after a few flights and brought the front of the turtledeck with it. My flying was partly responsible for that, but reinforce it anyway!

Flying

At first I had a little problem with too much incidence in the main wing (total decalage). I went back and looked at the plans and found them to be correct. I had failed to note that the wing sits in a bit of a saddle and mine was perched high in front. Set the incidence as shown on the plan and it'll fly beautifully.

As a 60" handlaunch this is a terrific little plane! You can get a nice high insertion without tearing up your body. The launch device is 52 years old at 220 lbs. and the launched vehicle is 6 weeks old at 20 oz. A strangely effective combination!

The plane has a flat, brisk glide with excellent penetration for a built up wing. Mine is very hard to tip stall in this configuration. I have a tendency to turn too low and slow and it hasn't dumped me yet. (Although I have flown it into several trees and a large park swing set ... it repairs easily!)

Bottom line

I fly at a local Metropark where other, mostly gas guys fly during lunch hour. (Nice guys though.) When I get a good launch and the THING climbs out over the parking lot you can hear the gawkers saying, "How does it do that? There's no motor...etc., etc." Ah! What greater reward...!

My recommendation: Why buy just one? Get em two at a time! ■

Slope Soaring On The Oregon Coast

...by Pete Bechtel
Coeur d'Alene, Idaho

Late November, my wife and I went for a mini vacation to the Oregon Coast for some R and R which, of course, included getting in some flying R/C sailplanes. We drove our newly acquired 33 foot motor home, Revcon.

Off we went with a load of planes on board. Saturday, we arrived at Lincoln City and met up with Wil Byers at the motel he was staying at, which was right on the beach.

The weather was showery and kind of iffy at best, but still very flyable. Wil and I loaded up our planes and drove up to Cascade Head about 8 miles north of town. What a place this is, 1200 or so feet on this huge head land that faces south and northwest. You can fly both sides of it. The day we went the wind was out of the Northwest, blowing a good 30 - 40 mph. We parked the truck and walked 3/4 of a mile on mostly level ground to the site on a well marked trail.

When we arrived at the site we found the wind to the northwest and really ripping. Wil had his Vixens and I had my newly rebuilt Acro. We had assembled the planes back at the truck to save time, not knowing if it was going to rain on us or not. We watched a seagull come up from the bottom of the hill and sky out in about a minute, so I tossed the Acro off into the jaws of the howling wind. All was fine for the moment. I was just getting set up to do some serious flying when all hell broke loose. The covering on the left wing came loose and ballooned up about a foot on the left wing. It went totally out of control. I put in full right, but it was going left anyway. At this point the plane was in real trouble and I could not do anything to get it back. It went into a big spin, straight down on the back side of the hill. The last few seconds I lost sight of it, or so we thought. Wil said he'd go get it. I was sick; all that work. Down the hill he went. After a good 5 minutes walk way down the hill, I waited for the bad news to show up. The next thing I saw was Wil holding the plane up in the air over his head. It was OK! When he got back up the hill to the launch site, 10 minutes later and out of breath, I couldn't believe it. It was still in one piece. All that happened was a loose aileron. After that mishap we decided to go back to the motel and try to fly in front of the building some forty feet in elevation above the beach. The wind was blowing straight into the cliff so why not try it here. The gulls were doing it; if they can fly off the lift generated by the cliff and building, so can we. Wil got his Vixen ready and I got my camera ready. There's a nice set of stairs going down to the beach and tons of sand to land on. Let's do it.

Wil tossed his plane off and up it went. He could get about 200 - 300 feet high and cruise around with the gulls. At one point I asked him to set up for some low fly bys with the beach and ocean in the background. The next thing I heard was, "Oh, No!" What? Splat! Right on the beach with Vixen. Well, there it was in pieces on the sand. We walked down to retrieve the carnage.

The wing had come loose from the fuselage. Canopy and battery pack were scattered about in the sand, but no real damage to the little plane, other than some chipped paint and sand rash. So much for that. We will have to return to Lincoln City for some more fun when the weather gets good.

The next day Wil, Mary Jo, and Bessie went home and Carol and I went on down the coast on our trip.

The next place we stopped at was Cape Blanco. What a great place this is to fly sailplanes. You can drive right down to the end of the point by the lighthouse, park, and fly off a cliff that is about 100' high and faces southwest or northwest with miles of beach to land on if you should have to, or land in grass on top; it is flat, too. There is a state campground a half mile down the road or so. It was closed for the season when we were there. I flew a Carat by CHK Models of Germany, with an RG15 airfoil, and had lots of fun ripping around the sky checking out the lift zones, until my finger about froze off and I had to land; it was late in the afternoon and I was looking into the sun.

This site is one of the best west coast flying sites I have seen. There are plenty of motels in Port Orford, 8 miles south on Highway 101. From 101, it's 5 miles out to Cape Blanco to the site. If you are into soaring like I am, you will love this site. I plan to go back this spring and stay for a few days.

Without getting too windy, there are a lot of other places to fly on the Oregon Coast. One site is on the south side of Hum Bug Mountains State Park on U.S. 101. There is a motel near the site. Anyway, the motorhome's throttle cable broke and that ended the fun for the trip. ■

Pete Bechtel (L) & Wil Byers (below) at the Spokane contest last fall.

Bill Maserang of Fort Worth, Texas is "On Top of the World" with his Legend. Photo by Scott Landers.

Curt Nehring
Southern California

R/C Soaring Resources

Do you hold seminars and workshops? Would you like to be included as a contact to answer questions on soaring sites or contests in your area? If so, please contact *RCSD*. Our address and telephone numbers are on page 1.

Seminars & Workshops

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

California Composite Seminars - We want to help you build better! Bring your project and let us help you with it. Thirty five dollars for a six hour plus Composite Technician lesson includes lunch! Two people minimum, please. Great mountain flying all year round! Clubs? We travel, too! Please call (805) 822-7994 and ask for Scott Metze.

Reference Material

Madison Area Radio ontrol Society (M.A.R.C.S.) *National Sailplane Symposium Proceedings*, 2 day conference, on the subject and direction of soaring. 1983 for $7.00, 1984 for $7.00, 1985 for $8.00, 1986 for $8.00, 1987 for $9.00, 1988 for $9.00, 1989 for $10.00, 1992 for $12.00. Delivery in U.S.A. is $3.00 per copy. Outside U.S.A. is $6.00 per copy. Set of 8 sent UPS in U.S.A. for $75.00, outside U.S.A. for $80.00. Last 4 (1987-1992) in U.S.A. is $45.00, outside is $50.00. Allan Scidmore, 5013 Dorsett Dr., Madison, WI 53711.

BBS

BBS: Slope Tech, Southern California; (310) 866-0924, 8-N-1

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

Contacts & Soaring Groups

California - California Slope Racers, John Dvorak, 1638 Farringdon Court, San Jose, California 95127 U.S.A., (408) 259-4205.

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

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

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

Kansas - Wichita Area Soaring Association, Pat McCleave (Contact), 11621 Nantucket, Wichita, Kansas 67212 U.S.A., (316) 721-5647.

Maryland - Baltimore Area Soaring Society, Al DeRenzis (President), 5003 Wetheredsville Road, Baltimore, Maryland 21207 U.S.A., (410) 448-0808.

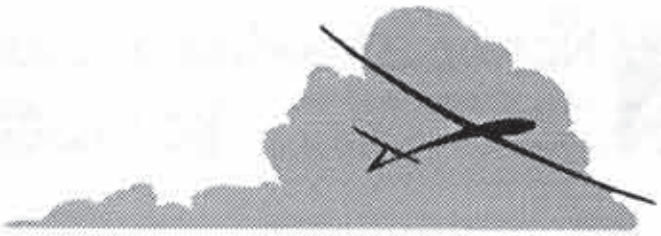
Nevada - Las Vegas Soaring Club, Steven Smith (President), 6978 Starwood Dr., Las Vegas, Nevada 89117 U.S.A., (702) 873-9591.

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

Texas - Texas Soaring Conference (Texas, Oklahoma, New Mexico, Louisiana, Arkansas), Gordon Jones (Contact), 214 Sunflower Drive, Garland, Texas 75041 U.S.A., (214) 840-8116.

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

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



F3B/USA

The Newsletter for the Multi-Task Soaring Enthusiast

Subscriptions: $12 / Year / Six Issues

Write: F3B/USA
George Spitzer
87 1/2 North Catalina Ave.
Pasadena, CA 91106

(818) 796-5024

LSF

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

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

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

You are invited to join the
NATIONAL SOARING SOCIETY

- OFFICIAL AMA SOARING "SPECIAL INTEREST GROUP"
- YEARLY NSS "SOAR-IN" TOURNAMENTS
- NATION WIDE "EXCELLENCE AWARDS PROGRAM"
- EXCELLENT BI-MONTHLY NEWSLETTER
- NSS FULLY SUPPORTS THE F3B SOARING TEAM & LSF SOARING PROGRAM
- NSS IS INVOLVED IN THE ORGANIZATION AND OVERSEEING OF THE SOARING PORTION OF AMA NATS (INCLUDING AWARDS BANQUET)
- YEARLY DUES ARE $15 U.S.A. AND $20 OVERSEAS (SPECIAL FAMILY RATES)
- NSS OFFICERS ARE FROM ALL 11 DISTRICTS

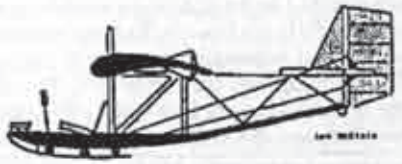
For Information, Contact:
NSS Secretary/Treasurer
Robert Massmann
282 Jodie Lane
Wilmington, OH 45177
(513) 382-4612

T.W.I.T.T.

(The Wing Is The Thing)

T.W.I.T.T. is an organization of engineers, scientists, pilots, sailplane enthusiasts, model builders and many other persons having an interest in flying wing/tailless aircraft technology. Write to T.W.I.T.T., P.O. Box 20430, El Cajon, CA 92021 to find out how you can participate.

Send SASE for membership application and flyer: "What is T.W.I.T.T." or, send $2.00 for full information package including one back issue of our newsletter, postpaid. Full membership is $15.00 per year and includes twelve issues of the newsletter. Back issues of newsletter are $.75 each, postpaid.



The Vintage Sailplane Association

VSA is a very dedicated group of soaring enthusiasts who are keeping our gliding history and heritage alive by building, restoring and flying military and civilian gliders from the past, some more than fifty years old. Several vintage glider meets are held each year. Members include modellers, pilot veterans, aviation historians and other aviation enthusiasts from all continents of the world. VSA publishes the quarterly magazine BUNGEE CORD. Sample issue $1.-. Membership $10.- per year. For more information write:

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

Classified Advertising Policy

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

For Sale - Business

DON'T YOU HAVE ENOUGH TROPHIES?? * ATTN: CONTEST DIRECTORS!!!** Award your winners w/shirts, caps, jackets, bags, individualized w/screen art (incl. place & class). Designed by fine artist and past Natl. Champion, Tom Jones. Golf shirts from $20.00, T's from $10.00. For more info. send S.A.S.E. to: **Zoomit Creations,** 16 S. Woodstock Cir., The Woodlands, TX 77381; (713) 363-3384.

SILENT FLIGHT CLASSIFIEDS, and more each month! List the gliders and electrics you no longer fly in our free ads. Radios, winches, snifflers and accessories, too. List it free in SFC. Subscriptions are 1 issue @ $1.00, 1/2 year @ $5.00, yearly @ $9.00. SFC, 329 Little Ave., Ridgway, PA 15853.

CARBON FIBER, 100 ft. 12k tow ... $9.95 plus $2.00 shipping and handling. (For information, send S.A.S.E.) DISCOUNT COMPOSITES, P.O. Box 96, Bountiful, UT 84011-0096.

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

IRON ON CARBON FIBRE 3.7 Oz./yd^2, .007 - 2"x48"... $9.00, 12"x48"... $18.00, 1'x10'... $42.50. Iron on S-glass, 12"x48"... $10.00. Chopped carbon fibre... $2.95 bag. 100# test kevlar pull-pull system, 25' plus teflon-teflon sleeving... $7.00. 100% satisfaction guaranteed. Only $1.00 S&H. CA res. add 7.75% tax. Send LSASE for brochure & free samples to: California Carbon, P.O. Box 39, Jamul, CA 91935; (619) 669-6348.

KIT BUILDERS. Complete Design and Tooling to Manufacture 46" Span PSS A-10 KIT. Includes top-quality vacuum form mold (ABS or H.I. styrene), trimming cutter, wing template, bending fixture, plans and instructions. Great looking and flying design. $450.00. Evenings: (805) 649-2680.

For Sale - Personal

2 Ace OLY V radios (Gold Sticker) w/4 Bantam Midget servos, 2 receivers, & SR batteries $125.00 each. 1 Airtronics Aquila Grande NIB $150.00. 1 Flite Lite Falcon 600 Built $300.00. Gordon Jones (214) 840-8116 TX

Accu-Vac by Aerospace Composites, Complete, new, unused... $200.00; Mueller F3B KING, used, RG-15 airfoil, 100 oz. flying weight, set up for Airtronics, includes 4-141 servos in wing... $500.00; Airtronics LEGEND, new, S-3021, 75 oz. flying weight, set up for Airtronics, trimmed and test flown only... $450.00. Contact Jim Thomas at (317) 497-3951 Indiana.

Airtronics INFINITY 600, Channel 28, Tx only... $200.00. Contact Bob Belton, 1901 N. Raintree Rd., Flagstaff, AZ 86004; (602) 526-8012.

2 Silver Seven Transmitters, gold stickered, on 12, 16, 46, 52 with 5 Silver Seven receivers on 46, 4 on 52, one on 12, and one on 16. Trade in value towards ACE PRO 8000 Tx and 810 Rx. Over $700.00. Will sell for $500.00. Jim Ealy @ (609) 448-8726 NJ.

ACE MICRO PRO Tx with FM receiver, channel 42, set up for Airtronics servos, kick stand & ACE carry case, brand new, never flown, latest EPROM, 2 stick... $300.00 + shipping. Ray Juschkus, 7 Evergreen Ave., New Hyde Park, NY 11040; day (212) 964-6515, after 6 pm (516) 352-0387.

MAGIC, Weston built T-tail, new RTF w/ servos mounted in wings and fuse... $550.00 or trade; DPS REIHER, Triton model, 1/6 scale, 124" wing span, new RTF w/servos... $425.00 or without servos... $325.00 or trade. Ray Cindric @ (215) 579-1576 5-9 pm EST or pot luck on weekends (NJ).

Futaba FP-T5UA "91", ch 32, Tx recal. by Futaba 8/92, with 7 ch Rx, 4 ch Rx, sw. harn., charger, instruction book... $105.00; Futaba FP-T7UAFS, new 7/92, ch 32, complete w/ xtra RCD 4/5 ch rec... $310.00. Both for $400.00. Clarence Emrey, 531 Arborlea Ct., Matthews, NC 28105; (704) 847-6503.

SPRING CLEANING SALE: I am selling some of my personal sailplanes and accessories to make room for more. MODI SD8000 Prototype... $485.00; MODI SD2062 Proto-type... $485.00; MODI RG-15, slightly damaged in shipping, completely repaired by manufacturer... $485.00; Rham winch & retriever set... $450.00; Vision 8SP radio... $300.00. All planes are great fliers and are in good condition. Prices do not include servos or freight. For more information, call Greg Chun on personal line at office (818) 309-6745 So. Calif.

Multiplex ASW-22, 4 M scale kit, pre-sheeted wings, spoiler blades and retract included... $300.00; Tekoa SHADOW, 118" thermal sailplane, built & flown, clear obechi finish on wings, very polished, 4 servos in wings, excellent condition, flies great... $550.00; SATURN 2.9T, built & flown only 11 times, polished, clear obechi on top of wing, black obechi on bottom, extra carbon fiber in wing, 4 servos in wings, good flying airplane, excellent condition... $450.00. Call Jack at (215) 547-4243 Penn.

WINDSONG, ready to fly, includes ail. servos... $345.00; ANTERES, complete except fuse needs painting... $150.00; CAMANO, NIB... $150.00; QUASOR, NIB... $110.00; WINDDRIFTER 100", NIB... $30.00; MINIMOA, NIB, 3-1/2M scale, Krick... $195.00; OLYMPIC 650, 72", NIB... $35.00; Dremel belt sander... $95.00; Dremel drill press... $15.00; Futaba FP-T7FG/K, AM, ch 52, xmitter only, no sticker... $35.00; Futaba FP-T4NL,AM, ch 46/ch 48, xmitter only, no sticker... $30.00; Futaba FP-R7H, AM W/B, ch 52, receiver... $12.00; Futaba FP-R4F, AM W/B, ch 40/ch 56 receiver... $10.00. Call Bill Maserang at (817) 838-2069 after 6 pm work days; 3320 Bewley, Fort Worth, TX 76117.

Air Jet SAGITTA from Germany, flown, never wrecked, ready to fly, comes with two Airtronics servos in the wings... $250.00 includes shipping in U.S.; TORNADO slope racer, NIB, from Austria, kit complete, presheeted wing with E-180 airfoil, fiberglass fuselage, misc. wood bits and hardware... $150 includes shipping in U.S. Call Jerry Slates at (214) 442-3910 Texas.

Scale fuselages: Astir Club IIIb 3m, Ka-6e 2 & 3m, Pilatus B4 3.25m, Pick 20 3m, ASW 19 4.2m, ASW 17/19 2m. Send $1.00 for complete info. to Etienne Dorig, 381 Joseph-Huet, Boucherville, PQ J4B 2C5 Canada; (514) 449-9094.

High performance SURPRISE II F3E glider. The Surprise II is designed and kitted in Austria by Rudolph Freudenthaler, the F3E World Champion. The airplane is very high quality with a one piece 75 inch wing using state-of-the-art foam core/glass fiber/carbon fiber/balsa sheeting construction and fiberglass fuselage. Included is the extremely powerful Plettenberg Hecktoplett 320K/6 Neodym 432 watt electric motor, speed controller, three minature servos, two 16-cell 1100 mAH nicad packs, and folding prop. Just add a receiver and transmitter. The airplane is brand new and has only been test flown once. Flying the SURPRISE II is a thrill of a lifetime. Invested over $1300.00. Will sell for only $997.00. Call Ralph at (603) 882-6022 New Hampshire.

ASW-24, 3.8 M, ready to fly (RTF), brand new... $520.00; ASW-24, 3.8 M, as a kit... $350.00; ASW-24, fiberglass fuselage w/cockpit/canopy... $130.00; VENTUS "C", 3.6/4.2 M, RTF, new... $520.00; VENTUS "C", 3.6/4.2 M, as a kit, airfoil as per order... $400.00; VENTUS "C", fiberglass fuselage w/cockpit/canopy... $150.00; GROB 103A Twin Acro 3.4 M, brand new, RTF... $600.00; GROB 103A Twin Acro 3.4 M, as a kit, airfoil per order... $450.00; GROB 103A Twin Acro 3.4 M, fiberglass fuselage w/cockpit/canopy... $200.00; SATURN 3M, RTF, new... $400.00; SATURN 3M, as a kit... $300.00; SATURN 3M, fiberglass fuselage... $90.00; TITANIUM wing joiner 3/8" diameter... $14/ft.; Retract landing gears for sailplanes aluminum made... $55.00 EA. Shipping not included. Call (305) 687-7706, Peter Zak, Florida.

Wanted

HOBIE HAWK right wing panel. Good condition. Call Mark Barbee at (203) 364-2130 CT.

NEW PRODUCTS

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

The AVION Epoxy Glass Fuselage (Made in the USA)

...from Slegers International

Slegers International is pleased to offer the AVION fuselage, which is manufactured by Wright Manufacturing. This lightweight epoxy glass fuselage is reinforced full length both sides with 1.7 oz. kevlar fabric for added strength and durability. Weighing in at roughly 3.5 oz. this fuselage allows you to build a small sailplane with an all up flying weight under 18 oz.

The AVION is intended to be a replacement or optional glass fuselage for many of the more popular wood built up fuselages that use a bolt on wing with a root chord of between 7 to 8 inches. The AVION makes an exceptional fuselage for your own wing design. A vacuum formed canopy is provided as well as a beautiful set of CAD drafted plans showing the recommended emmpanage and electro-mechanical control system. The AVION can be built with two, three or four servos depending on the controls you want coupled with a 270mah or 600mah battery pack and micro receiver. As you would expect the AVION requires micro servos if you will be constructing it with four servos. The AVION wing saddle will accommodate most any airfoil with minor sanding.

The tail boom is an oval shape that transitions into a well sculpted fin and merges beautifully into the wing saddle. The wing saddle is flush with the top of the tail boom to accommodate the varying root chords of the wing. The nose is very slender, but has a scale like appearance. The overall aesthetic beauty of this fuselage must be seen to be believed.

For more information and photos of the AVION please refer to the article in this issue of *RCSD* on "Making a Fiberglass Mold". To purchase an AVION fuselage please refer to the Wright Manufacturing AVION advertisement.

Slegers International is the sole distributor and can be reached at (201) 366-0880 8:30 AM to 5:30 PM except for Sunday and Monday. We accept major credit cards. ■

Model Airplane Containers for Safe Storage, Transport & Shipment

...from D&D Specialties

After 20+ years of contest travel experience, we have developed the perfect travel accessory for your special models: a corrugated plastic box constructed from white Pack-Lite™ material. This material is used by the U.S. Post Office and others for reusable shipping containers. It has been tested to ASTM standard D-4003, test method B, where paint can load specimens are subjected to a two-level handling shock impact test including 50 seconds @ 10 g's and 10 seconds at 40 g's. A 28-inch specimen without any packing or internal partitions also displayed a compression strength of 3700 pounds per foot prior to collapse. It's kid proof! (Test Report #42070-01 available)

Since RC sailplanes often have bird names, we thought that the term **"NEST"** rather than box best describes our foam-lined waterproof heat resistant container. We have shipped numerous sailplanes by UPS and airline baggage with great success. Only one repairable damage incident has occurred with Southwest Airlines where they apparently used two boxes to stop a moving overloaded fork lift. Shipments in cardboard boxes and plywood crates frequently suffer shipping damage.

NESTS can be labeled with a stencil and Carter's MARKS-A-LOT permanent broad tip marker so it can be "erased" with Isopropyl Alcohol.

A 7"x13"x52" Duck **NEST** is OK for 2 meter or standard at $79.95. The 7"x13"x57" Falcon or Legend **NEST** is $84.95. The 7"x15"x60" Super-V **NEST** and 7"x13"x62" Eagle **NEST** are $89.95. All **NESTS** have full depth sides and two adjustable nylon closure straps. Prices include shipping. Others can be custom made to your size specifications. Longer boxes are supplied with three straps.

When ordering your **NEST** box, we recommend you also purchase a **NEST ACCESSORIES KIT** @ $17.95 which includes:

1) A blanket (full length 1/2" soft foam insert)
2) Two pillows (one inch soft foam end inserts)
3) A perch (a length of A/C compressor insulation tubing) - Slit to slip on each edge of the open box to make a firm soft rest to set up and hold your model out of the dirt or wet grass. Point the **NEST** downhill into the wind.

Shipping Instructions

Place your wings and stab in their foam core cutouts in the box. Place the fuselage along side the wings or on top of them with styrofoam blocks to limit movement. Loosely fill extra space foam blocks, popcorn, tools, etc. in baggies, clothes or newspaper when shipping. For extra safety, when shipping your model, wrap 1/2" glass strapping tape once around each end and between each strap set so that the container edges are less exposed to catch on other boxes.

Dale E. Nutter, D&D Specialties, (918) 492-3760, FAX (918) 492-5641. ■

Zephyr Sailplane

...from McLean's Models

The Zephyr is an all composite 2 meter sailplane designed for high performance slope soaring and slope racing. The use of pivot wing technology, a streamlined fuselage, full flying stabilizer, and rudder results in an extremely fast and efficient sailplane. This sloper has proven to be very aerobatic - not contest but sport aerobatic and surprisingly stable at a wide speed range. The airframe was designed to be structurally sound in the air during high G maneuvers as well as when impacting the ground when slope landing conditions are not ideal. When flying at equal wing loading with the larger 100 inch+ span slope racers the Zephyr is very competitive. The Zephyr can be flown with simple 4 channel radios but a transmitter with rudder to aileron mixing and dual rates is recommended. With the use of modern composite materials such as EZ-LAM epoxy resin, carbon fiber, kevlar, and S-glass this model is very durable and should require very few repairs this side of major impacts and/or midairs. The idea here is to minimize repairs and maximize flying time. The kit will also be available as a semi kit containing: wing cores, stab cores, fuse, drawing and optional hardware package. The pivot wing control system although similar to others is heavy duty and designed to provide very solid wing control. The plane can be ballasted to well over 20 oz. per sq. ft. wing loading for high speed flight in good wind conditions. Ballasting can be achieved by changing the wing rod from carbon to steel and/or adding weight to the ballast compartment located at CG in the fuse. 90 inch wings will also be available on a special order basis for unlimited slope racing.

The all composite semi-ARF kit contains the following:

1. Vacuum bagged epoxy fiberglass wings with uni directional carbon fiber and plywood spar reinforcements. The leading edge is wrapped with kevlar and extra glass for durability. Special vacuum bagging techniques have been incorporated to insure maximum bonding properties while minimizing weight. High quality PRB blue foam feather cut wing cores are used. A sub rib for the drive pin is installed prior to bagging.

Specifications

Wing span	78 in.
Wing area	450 sq. in. (3.125 sq. ft.)
Aspect ratio	13.5 to 1
Stab span	19 in.
Stab area	63.5 sq. in.
Wing loading	15-17 per sq. ft. minimum
Weight	46-53 oz. minimum
Airfoil(s)	SD7003, S6062, S2055

Prices

$219.95 for semi-ARF kit 78" (2M)
$229.95 for semi-ARF kit 90"
$129.95 for semi-kit w/hardware
$99.95 for semi-kit less hardware
$19.95 for composite stabs

2. Epoxy fiberglass fuselage with canopy. The fuse contains full length kevlar and uni S-glass reinforcements. The tail boom is strong and stiff with glass doublers at the wing trailing edge where fuses of this type usually fail. The vertical fin is airfoil shaped using the SD8020 profile.

3. Feather cut stabilizer cores using PRD blue foam and the SD8020 8% airfoil. Optional composite stabs are available at an extra cost.

4. All major hardware pieces are included - Epoxy PCB bell crank for elevator control with holes marked. Heavy duty pre-built wing crank assembly. 3/8" x 12" carbon wing rod. 3/8" X 12" steel wing rod. Pre-cut plywood wing control servo tray made to specification of your servo dimension and mounting rails. 1/4 inch plywood root ribs shaped to specific airfoil. Owner must provide 1/8 inch ply for rudder post, balsa sheet for rudder, balsa (or other material) for stab sheeting, elevator + rudder cables, plus misc. hardware, wood and tubing.

5. Full size 100% scale drawing with accurate detail and written instructions.

For more information contact: Brian J. McLean, 75 Fleurance, Laguna Niguel, CA 92677; (714) 363-7331 EVE. ■

Lance 60

...from Glidesigns

This summer, Glidesigns will offer the Lance 60. This unique A.R.F. RC sailplane is equally suited for the slope or winch flying. Loops, rolls, spins and speed runs are all in a day's work for the newcomer to the slope and thermal arena.

This quality kit features a rugged epoxy fiberglass fuselage, with an aluminum tail boom. The solid balsa wing sections with a spruce leading edge are accurately machine shaped and pre-cut for proper dihedral angles. Tail surfaces are cut and sanded for proper alignment. Sullivan cables, hardware and step-by-step instructions for final assembly and flying are included. The Lance 60 can be built in 2 or 3 evenings.

The Lance 60 will accept standard radio gear with 250mah flat battery pack. Flying weight with standard radio is about 26 or 27 ounces. Wing span is 60", overall length is 34 1/2", Selig 3021 airfoil, and aspect ratio of 10.9:1. Thanks to a great airfoil and a clean low-drag design, the Lance will out thermal many sailplanes boasting greater wing areas with lighter wing loadings.

The stout construction will endure those high impact unscheduled landings with little or no damage. The Lance 60 is the most recent design from Eugene and Chris Lovejoy of Newbury Park, California, and can be obtained manufacturer direct for $129.00 plus shipping only from Glidesigns, 3990 Monterey Court, Newbury Park, CA 91320; (805) 498-7825. ■

Grifter E

...from Northeast Sailplane Products

This exclusive offering from NSP comes from the folks who make the Grifter sailplane. The same quality and completeness of construction are presented in this electric, which comes almost ready to fly. The fuselage is gel-coated and the wings and tails are fully finished and ready for a light coat of paint or covering. The two-piece wing bolts on and is easily removed for battery access.

Grifter E

Wingspan:	75"
Wing area:	540 sq. in.
Weight:	36 oz.
Wingloading:	9.5 oz./sq. ft.
Airfoil:	SD7037
Skill level:	INT/INT
Motor type:	7

Since the Grift-E uses a thin maple veneer, it is both strong and light: unlike obechi, it absorbs very little, so a clear coat of paint will add very little weight. If you're looking for an electric sailplane to take on trips, this is the one. Amazingly, the airframe weighs in at around 15 ounces!

Three servos control the Grift-E, two for the ailerons and one for the elevator. This is a good sailplane for both sport flying and thermal competition. The SD7037 airfoil will give you good penetration and glide, low wing loading, and a low sinkrate. Its compact low drag design and again its low weight will get you up to thermal altitude very quickly, so important in competition when you only have a short motor run.

This is a well-designed aircraft with excellent potential to be a winner in 7-cell thermal duration this year. (NSPGRI01 Grift-E Electric Sailplane $375.00)

Sal: *With the new AstroFlight 5-Turn motor, the Grift-E hauls butt! I am very impressed with the flying characteristics of this sailplane. A 15-second motor run is enough to nearly speck it out. If that isn't enough, the Grift-E will range with a very flat glide. When you find a thermal you can slow it down and it will climb like the real sailplanes I'm used to.*

We have put together a motor package complete with AstroFlight FAI 05 5-turn cobalt motor, 7 cell 1000mah battery pack, Fruedenthaler 8x5 prop, spinner and adapter, and Simprop BEC motor control with soft start and brake. Included are all connectors, and mounting hardware. (NSPPAC02 Electric Motor System $239.95)

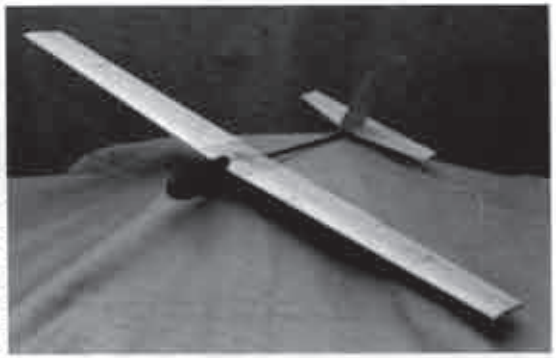
Sal: *The next thing I'm going to try is a FAI 035 6-Turn Cobalt motor on 6 600mah cells. I think I can get the weight down to 33 ounces. It should be an unbelievable thermal machine!*

Northeast Sailplane Products, 16 Kirby Lane, Williston, VT 05495; (802) 658-9482. ■

Invader

...from Northeast Sailplane Products

Here is a slope soarer that's not for the timid! A high aspect ratio sailplane that goes fast and is highly maneuverable. Stash this petite sloper in your car; it takes up very little room and you'll always have it available. Maybe a little lunch hour flying? How about stopping off at the slope on the way home from...wherever?



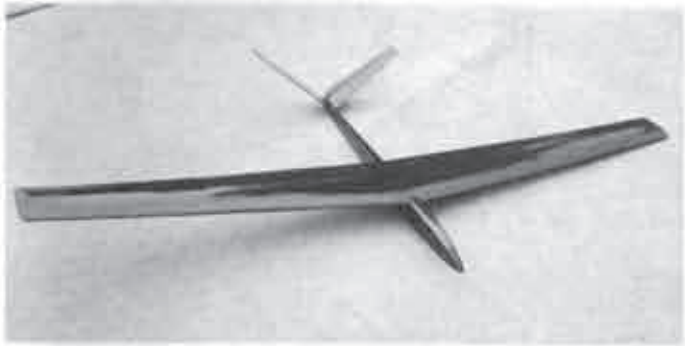
Invader

Wingspan:	42"
Wing area:	280 sq. in.
Weight:	12 oz.
Wing loading:	5.5 oz/sq. ft..
Airfoil:	Vader airfoil
Skill level:	INT/ADV

The Invader comes literally ready to fly. The pod-and-boom fuselage is painted black. Aileron cables are installed and the ailerons hinged. All you do is install the servos and put the hand sanded, hand lacquered balsa wing on the fuselage with a couple of rubber bands. The tails are balsa sheet, sanded and lacquered. The elevator is hinged and installed. Even the elevator push-pull cables are installed with the control horns attached to the elevator and ailerons. From box to ready to fly, including radio installation, should take only an hour or so. The Invader even has a micro switch installed in the side of the fuselage. Solder on the proper connectors for your particular radio and you're ready to go.

Since the Invader is a small glider, radio gear needs to be small: micro servos, receiver, and a 100mah battery pack. Agility and speed are the primary attributes of this wonderful little guy and flying on a small tight slope becomes a fun experience.

GGDINV00 GGD Manufacturing Invader $149.95, Northeast Sailplane Products, 16 Kirby Lane, Williston, VT 05495; (802) 658-9482. ■



Hurricane 60" Slope Racer

...from Greco Technologies

The Hurricane 60" Slope Racer is one of Greco Technologies' new releases. This plane was specifically designed for the 60" slope races that are becoming very popular. Pilots like to go out and race with these small maneuverable planes and not have to worry about damaging them. The members of the design team at Greco wanted to get into the action at the races so they designed their own.

This racer is quick to build, inexpensive, and durable. Exactly what you want, whether you are racing on the slope or pushing the outside edge of your performance envelope with aerobatic maneuvers. The wings are made of precision cut white foam, with pre-cut Obechi sheeting for fast building. The Hurricane also employs the use of composite materials for added strength. The wing is a top mount, straight wing with a single taper. The use of flaperons allow for great maneuverability. The SD8000 is fast and turns well, both of these characteristics are important in racing. The low drag at high speeds and the good sink rate performance of this airfoil gives it more diversity. The fuselage is built-up balsa with a V-tail to keep the weight down. Both have been machine cut for easy assembly.

The Hurricane comes in kit form. Like all of Greco's kits this one comes complete with a detailed instruction manual with comprehensive drawings and diagrams, an extensive hardware package, and other material needed to complete the project. This kit also comes with optional suggestion on how to use additional composite materials to further strengthen the airplane for the hazards of slope flying. This ship requires a 4 channel micro receiver and three micro servos. One servo for the tail and one servo for each wing. The Specifications for this ship are: Wingspan: 60 inches; Wing Area: 345 inches^2; Fuselage Length: 31 inches; Weight: 16 ounces; Wing Loading: 6.7 ounces/foot^2; Root Chord: 7.5 inches; Tip Chord: 4 inches; Airfoil: SD8000; Wing Planform: Straight wing, Single Taper; Tail: 110° V-tail; Aspect Ratio: 10.4:1; List Price: $80.00. For more information about the Hurricane or any of Greco's other kits please write to P.O. Box 10, South Pasadena, CA, 91031; or call (213) 680-2070, during standard business hours. ■

JR 649S Receiver

...from Horizon Hobby Distributors

The saying, "Big things come in small packages," couldn't be more true than with JR's new 649S receiver. The smallest 9 channel receiver made, it boasts some fantastic radio control technology.

JR has incorporated a new, refined version of their exclusive Anti-blocking, Cross-Modulations and Window (ABC&W™) filtering system. ABC&W™ begins with a very small electronic window. Any signal that is distorted or off-frequency won't fit through the window and is immediately rejected. Then the new signal is cleaned up, amplified, and sent through the window again. This process is repeated until nothing is left but the purist signal possible.

The new ABC&W™ features an additional "unwanted interference limiter" and a high degree of signal filtration. And just how good is the new ABC&W™? We had the 649S tested by an independent laboratory. The lab found it to be essentially immune to 3IM and 2IM interference.

Almost equally striking about the 649S is its incredibly small size, at a mere 1.42"x2.00"x.63" (WxLxH) and a scant 1 ounce in weight. Normally, high capacity receivers result in bulky, heavy units. Surface Mount Technology electrical components help produce this extremely small unit, and are also less prone to damage from vibration.

JR radio control systems and accessories are available through hobby dealers nationwide. JR is exclusively distributed by Horizon Hobby Distributors. ■

Schedule of Special Events

Date	Event	Location	Contact
June 13	F3B Benefit Contest- Inland Soaring Society	Riverside, CA	Joe Rodriguez (714) 924-9537
June 12-13	Lift Summer Soar	Traverse City, MI	Jim Johnston (616) 938-1272
June 13	Great Rocky Mountain Handlaunch Contest	Denver, CO	Lenny Keer (303) 737-2165
June 13	Tasks T1,T7,T8 Contest	Dallas, TX	Gordon Jones (214) 840-8116
June 19-20	F3J EOLE International	Paris, France	Jean Francois Chevrier (33) 35 55 88 13
June 19-20	Slopeglide II	Ribble Valley	Ian Benson 0254 387176
June 19-20	Renewed CVRC North South Soaring Challenge	Visalia, CA	Ed Hipp (209) 625-2352
June 19	2M, Open Canyon Lake Classic	Austin, TX	Tom Meeks (210) 590-3139
June 20	H/L Canyon Lake Classic	Austin, TX	Gene Warner (210) 732-3101
June 20	TULSOAR Contest	Tulsa, OK	Mike Teague (918) 747-1245
June 20	Open & 2M CMRC	West Westboro, MA	Jim Reith (508) 765-9998
June 26-27	NASF/MASS Mid-South Soaring Champs	Huntsville, AL	Ron Swinehart (205) 883-7831 Eve.
June 27	TULSOAR Fun Fly	Tulsa, OK	Jim Stephenson (918) 627-3809
July 4	610, 612 DEAF Dallas Electric Aircraft Flyers	Dallas, TX	Gary Warner (214) 235-1124
July 4	Soaring Contest North TX Aeromodelers	Denton, TX	Al Sugar (214) 436-5200 Days
July 11	Annual Handlaunch	Dallas, TX	Bud Black (214) 235-0867
July 17-18	GVRC Summer Dual Meet	Nunica, MI	Cal Posthuma (616) 677-5718
July 18	Aero-Tow Demo. Top of NJ (Club) - Raindate is July 25	New Jersey	Warren Miller (908) 852-1668
July 16-27	AMA NATS	Vincennes, IN	
July 24-25	North American Scale Soaring Assoc. Rally	Richland, WA	Wil Byers (509) 627-5224
July 24-25	F3J Interglide	West Midlands	
July 31-Aug. 1	Thermal Contest	Montreal, Canada	Etienne Dorig (514) 449-9094
Aug.	F3B World Championships	Sava, Israel	
Aug. 1	60-Min Enduro Dallas Electric Aircraft Flyers	Dallas, TX	Chuck Fisher (214) 270-2634
Aug. 7-8	Sailplane Meet Contest - Inland Empire Soaring Society	Washington Area	Robin Kirpatrick (509) 489-5841
Aug. 8	Task T1 Contest	Dallas, TX	Tom Peadon (214) 644-6131
Aug. 7-14	LSF NATS	Vincennes, IN	Mike Stump (616) 775-7445
Aug. 14	LIFT Aug. Soar In	Traverse City, MI	Jim Johnston (616) 938-1272
Aug. 14-15	Summer Soaring Festival - Soaring Union of L.A.	Carson, CA	Steve Addis (310) 320-2708
Aug. 14-15	F3J Hollandglide	Netherlands	
Aug. 16-22	Fun Fly Soaring Week	Salt Lake City, UT	Bob Harman (801) 571-6406
Aug. 21	2M, Open	San Antonio, TX	Perry Van (210) 658-8842
Aug. 21-22	SBSS Summer Classic Open Thermal Comp.	Morgan Hill, CA	George Paige (916) 273-0415
Aug. 21-22	F3J Euroglide	Belgium	
Aug. 28-30	British Gliding Nationals		RAF Cranwell
Aug. 28-29	GVRC 2-M Champs man-on-man	Nunica, MI	Cal Posthuma (616) 677-5718
Aug. 29	TULSOAR Fun Fly	Tulsa, OK	Mike Teague (918) 747-1245
Sept.	F3J	Germany	
Sept. 4	CAMS Northern MI Sailplane CH.	Cadillac, MI	Mike Stump (616) 775-7445
Sept. 4-5	NW Soaring Meet Inland Empire Soaring Society	Washington Area	Don Hendricks (509) 534-1664
Sept. 5	609, 611 DEAF Dallas Electric Aircraft Flyers	Dallas, TX	Robert Taylor (214) 279-9296
Sept. 9-12	World Cup	Czechoslovakia	
Sept. 11-12	Masters of Soaring (Sponsored by Weak Signals)	Temperence, MI	Art Slagle (313) 477-2228 Eve.
Sept. 18	H/L	San Antonio, TX	Jerry Caldwell (210) 438-4077
Sept. 18-19	TNT Texas National Tournament	Dallas, TX	Henry Bostick (214) 279-8337
Sept. 26	TULSOAR Fun Fly	Tulsa, OK	Terry Bryant (918) 482-5817
Sept. 26/Oct. 3	2M Postal	Everywhere	Steen Hoej Rasmussen
	Denmark - Details in *RCSD*, "Soaring Site", June 1993		
Oct. 2-3	20th Annual CVRC Fall Soaring Festival	Visalia, CA	Jerry Fox (209) 733-8091
Oct. 2-3	Annual DEAF Fun Fly - Electric	Dallas, TX	Frank Korman (214) 821-0393
Oct. 9-10	5th Annual MASS Fall Soaring Tournament	Memphis, TN	Bob Sowder (901) 757-5536
Oct. 10	Annual Dual Elimination	Dallas, TX	Jim Truitt (214) 348-2929
Oct. 16	Open	San Antonio, TX	Jerry Caldwell (210) 438-4077
Oct. 16	TULSOAR 12th Last Fling of Summer	Tulsa, OK	Sandy Hay (918) 665-8069
Oct. 17	TULSOAR 2M & Unlimited	Tulsa, OK	Perry Gilstrap (918) 455-5490
Oct. 24	TULSOAR Fun Fly	Tulsa, OK	Mike Stephenson (918) 445-3002
Nov. 7	610, 612 DEAF Dallas Electric Aircraft Flyers	Dallas, TX	Jack Hamilton (214) 348-4669
Nov. 14	Task T6 Triathalon	Dallas, TX	Chuck Fisher (214) 270-2634
Nov. 28	TULSOAR Fun Fly	Tulsa, OK	Doug Drullinger (918) 838-0282

Nov. 20	2M, Open	San Antonio, TX	Gene Warner (210) 732-3101
Nov. 21	5th Annual MASS Turkey Shoot	Memphis, TN	Mike Kelly (901) 756-9410
Dec. 26	TULSOAR Fun Fly	Tulsa, OK	Corey Gilstrap (918) 455-5490

** For more information about the Inland Empire Soaring Society, contact Al Lies, 1321 S. Rotchford Rd., Veradale, WA 99037.

***Additional information on the contests listed in Europe is available from *SOARER*, a British publication. Jack Sile, Editor, telephone 0449-675190 Suffolk, England.

NASSA 1993 NASSA

R/C SOARING

SCALE RALLY

July 24 & 25
TRI-CITIES, WA

A TRUE SCALE RALLY FOR THE SCALE SOARING ENTHUSIAST. FEATURING: SLOPE SOARING OR THERMAL SOARING. LAUNCH YOUR MODEL FROM A HILL TOP, OR WINCH, OR GET A TUG ASSISTED TOW!!

AN EVENT FOR SCALE R/C SOARING MODELS OF ANY KIND FROM VINTAGE, TO POWER SLOPE SCALE, TO MODERN ALL GLASS SUPER SOARERS; BRING WHAT YOU LIKE!!!!

A SOARING EVENT ABOUT FUN!

HOSTED BY THE:
NORTH AMERICAN SCALE SOARING ASSOCIATION
3540 EASTLAKE DRIVE; WEST RICHAND, WA 99352
1-509-627-5224

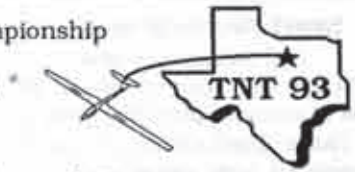
SPONSORED BY: JR RADIOS

SPONSORED BY: JR RADIOS

MAKE IT A WEEKEND OF SUN AND FUN FOR THE WHOLE FAMILY! BRING THEM TO ENJOY THE NASSA's SCALE RALLY AND THE COLUMBIA CUP UNLIMITED HYDROPLANE RACES ON THE MIGHTY COLUMBIA RIVER.

The Texas State Soaring Championship

September 18 & 19 1993
Dallas, Texas



9th Annual Texas National Tournament

Task - Thermal Duration 3,5,7,9,11 w/FAI Landing

CLASSES:
2 Meter -Saturday
Open - Sunday
Junior, Novice
Sportsman, Expert

AWARDS:
1-5th place Sportsman & Expert
1-3rd place Novice & Junior
Overall Winner

INFORMATION: Henry Bostick (214) 279-8337
5517 Hidalgo Court
Garland, Texas 75043

Sponsored by
The Soaring League of North Texas
Pre-registration requested. AMA Sanctioned

TWO GREAT CLUBS SPONSORING ONE GREAT EVENT & TRADE SHOW

SECOND ANNUAL MID-SOUTH SOARING CHAMPIONSHIPS

The largest sailplane contest EVER held in the South will be held in
HUNTSVILLE, ALABAMA
Dates: 26 & 27 June, 1993

CLASSES: Unlimited Sailplane
Novice, Sportsman, Expert

AWARDS: 1st-5th both days
plus *HIGH OVERALL* all Classes

Juniors- Sponsored by RCSD: 1st - 3rd, both days only

COST: $ 15.00 1 Day/ $20.00 -2 Days;Jnrs. $6.00 1 day/ $10.00-2 days

Due to the anticipated attendance to this event, pre-registration & payment will be requested. For complete information, write or call:
Ron Swinehart (205) 430-0113 Day, (205) 883-7831 Evn -HSV
Rob Glover (205) 883-2988/HSV: Mike Kelly (901)756-9410/MPS
Bob Sowder (901) 757-5536/MPS

SPONSORED BY
NORTH ALABAMA SILENT FLIERS
& MEMPHIS AREA SOARING SOCIETY
AMA Sanctioned

South Bay Soaring Society Summer Classic

The South Bay Soaring Society (SBSS) is proud to present "The SBSS Summer Classic". This will be 8 rounds of Open Thermal Competition with precision duration and landings. There will be an Aero-Tow demonstration at lunch on Saturday. The contest is on the weekend of August 21st & 22nd. The site is the Hill Country Golf Course / Flying Lady Restaurant in Morgan Hill, California, about 15 miles south of San Jose on Highway 101. The CD is George Paige and the assistant CD is David Burwell.

The 8 rounds are planned for two days: 5 on Saturday and 3 on Sunday. We will open late registration and check-in at 7 A.M. Saturday morning, the pilots meeting will be at 8 A.M. with the first flight at 8:30 A.M. There will be no rounds starting after 4:30 P.M. on Saturday or 1 P.M. on Sunday. This will allow everyone to relax and enjoy the BBQ on Saturday night, and then on Sunday have enough time for the raffle and trophies.

If you pre-register, the entry fee is $25. It will be $35 on the day of the contest, subject to frequency availability. All entries will require a second frequency, and we will allow only 5 entries per channel. Entries will not be accepted postmarked before July 1st. Entries will be limited to the first 150. The last day to pre-register is July 31st. You can use the entry form to show how many people will be coming to the BBQ on Saturday and if you would like a contest T-shirt. The cost of the BBQ and the T-shirts will be announced on the entry form. *(The entry form was not sent in with this announcement.)* There will be two classes: Open and Novice. Trophies will be handed out to at least 5th in Open and at least 3rd in Novice.

Contestants may show up on Friday night. There is on-site RV parking, but no hookups. We are billing this as one of the most civilized sites in the west. There is lots of shade. The RV and auto parking is only a short walk to the flight line. There are bathrooms (no showers) for men and women. There will be a Chuck Wagon with food and drinks all day Saturday and Sunday. The Flying Lady Restaurant is within walking distance of the field. There are many "Fast Food" style restaurants within 5 miles. We are planning to have discount motel rooms available within 2 miles of the contest site.

Saturday night there will be a BBQ with chicken and ribs. There is also a raffle with many prizes from the different sailplane companies and many of the local businesses. Raffle tickets will be available on Saturday and Sunday. We are planning a bus trip into Gilroy on Saturday for anyone interested in shopping at the Outlet Center, a local factory outlet discount shopping mall.

Please bring the family to this contest. We want everyone to enjoy themselves here. We want to make this an annual affair, so we plan to do it right the first time.

CD: George Paige, 15515 Mattson Lane, Grass Valley, CA 95945; (916) 273-0415

ACD: David Burwell, 402 Gwinn Court, San Jose, CA 95111; (408) 365-7312 ■

SUMMER SOARING FESTIVAL
AUGUST 14 & 15
1993

Soaring Union of Los Angles, SULA
and
The California State University
Dominguez Hills, CSUDH
Invite you to attend
A 2-Day AMA R/C Soaring Contest
To raise money for the School of
Science, Mathematics & Technology
Scholarship Fund. Entry $30.00
At SULA Field, CSUDH, Carson CA
Many Awards & Big Raffle
On-Field RV Parking
Sat. night $10 BBQ & Nite-Fun-Fly

Call Ed Kennedy (310) 519-7628

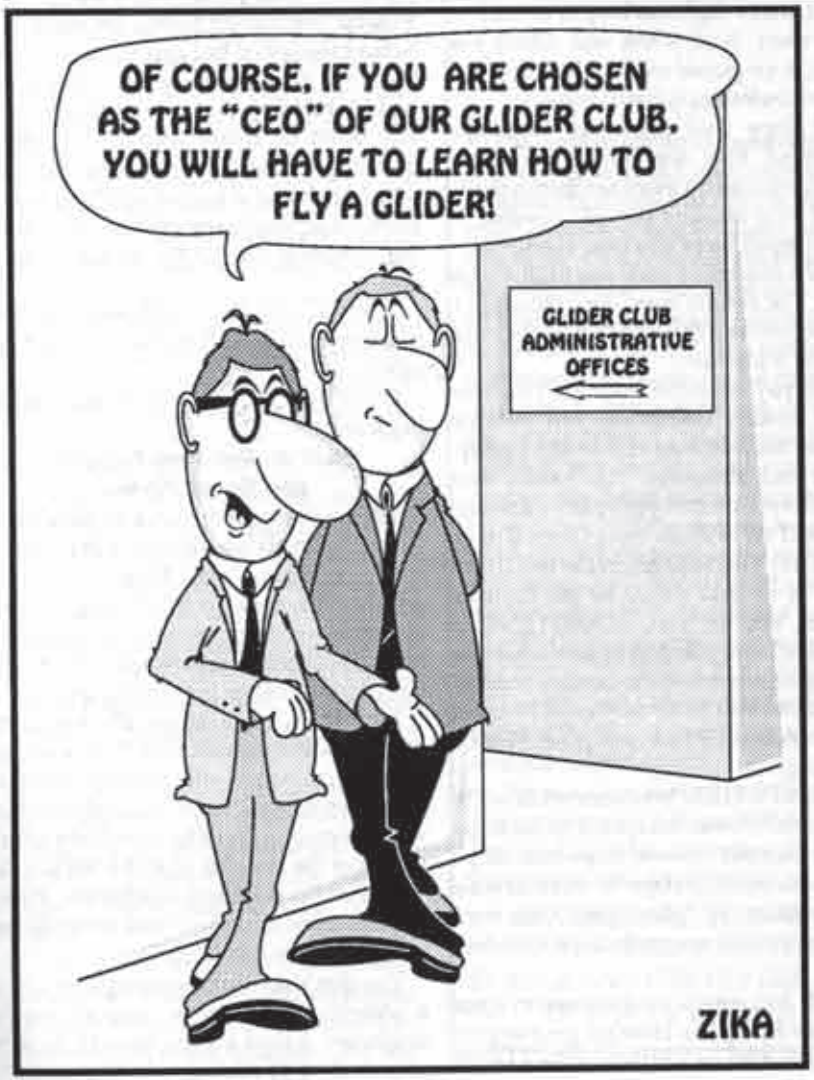
South Bay Soaring Society Summer Classic

A 2-Day Event Filled with Open Class Thermal Competition

August 21 & 22, 1993

Tasks:	Saturday	5 Rounds of Precision Duration
	Sunday	3 Rounds of Precision Duration
Place:	**Flying Lady / Hill Country - Morgan Hill, CA**	
Entry Fee:	$25.00 Pre-Registration	
	$35.00 On-Field (Subj. to Freq. Avail.)	

Camping & RV Parking On Site, Limited Facilities,
Food and Discount Hotels Nearby
CD - George Paige (916) 273-0415; ACD - David Burwell (408) 365-7312
Outlet Shopping Tour on Saturday • Raffle • BBQ



What's the Big Deal About Contest Flying?

...by Mike Clancy
Novato, California
(Mike wrote this article for *Hot Air*, the newsletter for North Bay Soaring Society. ED.)

Part 1: For Experts Only

Congratulations, Joe Pilot, you are now an expert RC sailplane builder and flyer!

At the thermal field you launch higher than anyone, find thermals as if by instinct, make flights as long or as short as you want, land when and where you want, your planes are well built and perform flawlessly.

At slope your planes are sleek and beautiful, they are among the fastest there, you can do more aerobatics than a lot of your buddies thought possible. In impromptu races you beat everyone.

For a change of pace you built a scale ship. The results were very pleasing. It looks great and flys fine on both the slope and off a towline.

You pay attention to detail. You have good battery discipline, you perform regular maintenance on your radio equipment and airframes. You hardly ever crash anymore and your planes are usually sold off to make space for new ones.

WOW! You're on top of the world! For most of us this would be the ultimate dream, but for you, SOMETHING IS MISSING and you don't know what it is. Flying sessions seem to be very routine. You know you're a pretty good flyer but you're not really sure how good. What is missing?

WHAT'S THIS? You've never flown in a contest? Never competed in an organized thermal contest, slope race, slope aerobatic meet, a slope or thermal scale competition or "good grief" not even F3B multi-task events (humor intended, mc)?

Well Joe, now's your chance to spice up your flying life. Here's a great opportunity to dine on a little (maybe a lot) of humble pie.

It's time for you to try your hand at CONTEST FLYING.

Remember how much fun it was when you started flying and successfully reached and overcame each obstacle? Remember how each success led you to more determined effort and how each failure did the same? Remember when you were always meeting new and interesting flyers many of whom were better flyers than you and were willing and able to help you. Remember when your planes were not the best looking, the highest flying, the most aerobatic or the fastest but you worked to make them so? Remember the enthusiasm you had for building that new design because you could do better with it? Remember traveling to and flying at new sites? Remember the new knowledge you had to learn? And finally remember how satisfying climbing the ladder of achievement was?

Well Joe, thanks to your entry into contest flying, all these things are here for you again.

CONGRATULATIONS! You are now a beginner!

Part 2: For Non-Experts and Sport Flyers.

There are two main types of model aircraft flying. Sport flying, the heart and soul of model aviation, is the largest and most popular; the other is contest flying. Though not apparent from reading the modeling press, most modelers are sport flyers and hardly ever engage in formal competition.

I would like to encourage all sport flyers, beginners and experts alike to give contest flying a try. Even if you choose to remain a dyed-in-the-wool sport flyer please bear with the contest types for from their efforts you reap the benefits of technological development in electronic equipment, building materials, launching and retrieval systems, and flying techniques.

You don't have to be a great pilot to fly in a contest; most contests have a class for beginners. About all you have to do is be able to fly a hi-start or winch launch, fly around for a while, then land your plane on the field you launched from. That's not too difficult, you do it all the time. The rules allow someone else to launch your plane and run the winch if you prefer. If you are an expert flyer but a newcomer to contest flying you may fly in the novice class until you become proficient enough to compete in the higher classes.

Contest flying will improve your skills. You will become more disciplined in your flying because you are flying planned flights and landings. You will pay just a bit more attention to aircraft, radio and especially battery maintenance. After all after a long drive to a contest site you want everything working right so you can get your flights in.

Attending contests will give you the opportunity to fly with and against very proficient builders and flyers, and you will usually see examples of the latest technology and techniques. You will see planes, equipment, and people that you might otherwise only read about in magazines. This environment will automatically provide a great source of knowledge relative to our sport.

If you are involved with the League of Silent Flight self accomplishments program, contest flying is a requirement for achieving the higher levels.

While attending contests you will meet a variety of interesting and likable people. I have made some lifelong friends of individuals I met at out-of-town contests. For me the social aspect of contests has now become almost as important as the competition itself.

And most important, contest flying is fun. Although winning is probably the most fun, it is not the most important thing. Flying to the best of your ability and equipment and knowing you did so can be very satisfying.

So give it a try, break the routine, learn something new and meet some new people. Ask any of your fellow club members who are contest flyers to help you out - they will be glad to. ■

NASSA News

This month's column is from NASSA member, Greg Vasgerdsian. Greg tells about his perspective on scale and gives us some insight into what is real and what is not with respect to scale soarers.

Scale Soaring Fact and Fiction

...by Gregory Vasgerdsian

Imagine going to a glider contest or fun fly where you had to look at length at every single model out at the field! Where every model was something different to look at, something really neat. If you're bored with the same old models, want something different, something that attracts a little attention, that is absolutely beautiful on the ground and in the air, take a look at scale soaring.

Expensive, hard to build, and hard to fly is what many modelers think when you mention the words scale model, not to mention the thought, "Where am I going to fly a 15' foot monster sailplane!" This premise is based a bit on fact and mostly fiction, from R/C modelers who never have owned a scale R/C sailplane or flown one. Whether it's a scale ASW-20, P-51 Mustang or Pteranodon flying dinosaur you're sure to have a model that will attract attention, give you goose bumps when it's in the air, and can perform! That said, let's take a closer look at scale models.

Just what is a scale model glider or sailplane. It's a model which is a scaled down replica of the real full-sized aircraft. When 1/6, 1/5, 1/4, or 1/3 scale is mentioned, it simply means the model is exactly one sixth the size of the real aircraft, hence if the real aircraft spans 60 feet, a 1/6th scale model of that aircraft would span 10 feet. Simple enough, right? Of course, scale models can be modeled 1/1 or scaled up 2/1, etc.; say a 1/1 scale Bald Eagle, or 10/1 scale hummingbird; whatever your wish, just scale it!

Today, we have not only scale models of full size gliders and sailplanes, but also Power Slope Soarers (PSS). PSS models are aircraft which in the last eight years have grown tremendously popular everywhere including the US. Power Slope Soarers are slope soaring gliders which are scale models of full size powered aircraft. Subjects range as widely as there are planes in the world, from a P-51 Mustang to an A-4 Phantom jet, to a DC-3. In general, the PSS model is fast, aerobatic, and needs the lift of the slope for extended flights. This is a generalization though, as it would certainly be possible to build a scale glider of say a U-2 Spyplane that could be a great thermal model and capable of being towed up a winch line.

True scale, semi-scale, who cares? A true scale model is just that, all dimensions are true to the full size aircraft, even the airfoil. Semi scale models usually look very much like a true scale model but on closer analysis, you will note sometimes minor and sometimes major deviations from the real aircraft. These deviations might be a reduced aspect ratio, non scale airfoil, bigger stabilizer, more dihedral, etc. The purpose of these deviations are usually in the designer's eye to produce a model which will fly "better". Notice I said "better" not better, as this is not necessarily true. For a good score in scale contest, proportions are very important and therefore one must consider whether the model will be used for scale when modifying a design.

Currently, Sport Scale is the popular class, and is what is run at the NATS. In Sport Scale the model is judged on its proportions to a 3 view drawing, markings, and flying. Also, the model must have been built by the contestant, as well as a few other points. (Check your AMA rule book for more details.) You do not need to heavily detail the model, you don't even need an instrument panel in the cockpit. Personally, the biggest kick of flying scale is that your model looks like a real aircraft in the sky, so what if the stabilizer is 10% bigger!

Myth number one: Scale models are expensive. You read about some 1/4 or 1/3 scale all glass sailplanes from Germany and you figure well that's impressive, but it's also beyond my bank account. You can spend quite a bit on a scale model but you don't have to. It all depends on where you get the model, and to what level if any that it is prefabricated. At the top of the heap are many of the European glass kits, such as Fiberglass Flügel. These models are modeled after the modern high tech, high performance big boys, like the ASW-25's, Salto's, etc. Though most sport fliers might gasp at a price tag of $1,000.00, when you find out what you get you'll know the meaning of, "You get what you pay for." These "Kits" are highly prefabricated and have beautiful Fiberglass gel coated fuselages (no painting necessary), wings and tail planes. To the purchaser of a kit like this it comes down to installing the radio, and decals. What you get is a very efficient, strong, and high performing sailplane for the slope or the flat field.

A step down from these might perhaps be models such as the Graupner or Robbe line. Priced from around $300 to $600, these kits are highly pre-fabricated, feature glass fuses and foam core wings already sheeted with obechi wood. Robbe carries some nice looking ships like the ASH-25 and ASW-27, and Graupner has an impressive Ventus C and Discus. Again, about all that is left for the modeler is to install the radio, and cover the wings.

Stepping down to actual kits, we find very little available in the U.S. At one time Airtronics offered a 2 meter span Cadet UT-1, but it is no longer available. Some of the smaller cottage industry makers do fill the void a bit with VS Sailplanes, Viking Models U.S.A., Icare Models and a few others you might see advertise at times in *RCSD*. For the PSS modeler, NSP's catalog has a number of possibilities like Quality Fiberglass' ME-163, Vern Hunt's Aero L-39, and Slope Scales various W.W. II aircraft. There is also the possibility of ordering from overseas. See Wil Byer's column in the June '92 *RCSD*.

Lastly, we have... Scratch Building... Yes, run for the closet and close your eyes, indeed if you hate building you might as well skip the paragraph. Building from scratch is the most economical way of going scale if you don't consider as part of the bill the time you spent building. Best of all it gives you a very wide spectrum of subject matter to choose from. All the model publications I am aware of have plan services, most have a number of scale gliders included, and there are a few places you can get partial kits from, as well. I would check with all the magazine plan departments, plus Bob Holman Plans, and also Jim Ealy. Just off the top of my head I know of a set of plans available from *RCM* of an 80" Slingsby. This model could certainly be built by a modeler with a few kits under his belt, and I happen to know it is a very stable, well behaved flier. I once had one!

Myth number two: Scale models are difficult to build and take a lot of time to build. Of course, this all depends on your level of experience, and what type of kit (if any) you have purchased. Most modelers think of the power guys when they think of scale. You read a model magazine and see the before picture of some poor guy who spent 30 hours just detailing the machine gun bullets in the pop open ammo access hatch of his B-26, then see the after picture of the model ripped in half as it went warp nine into the asphalt and you get this ingrained picture in your head that says, "Scale models? You must be crazy!" A scale glider does not take hundreds of hours to build even from scratch, unless you want to build an absolute museum piece. There are those who really get into doing things extremely accurate and detailed, but if you don't want to you don't need to.

Building a scale model does not make

it necessarily any harder to build from scratch then a sport model, cutting ribs is cutting ribs, and cutting foam cores is cutting foam cores. Don't get scared by the power modelers and their scale masters tournaments, you don't need to put the rivets in, or even a dashboard and pilot! If you're able to spend more money you can do less building by buying a partial kit, or a pre-fabricated kit like Graupner, Robbe or Glas Flügel.

A small PSS model like Slope Scale's ME-109 with a small wing span can certainly be built as quickly as any other slope model kit. Size is an important factor, a two meter model will of course go together quicker than a 12 foot! All of which brings us to the next myth.

Myth number three: Scale models are just too big. As we've touched on a bit already, to be scale does not mean over 12 foot wingspan required! Here, many of the PSS models really show themselves with spans of 50" or smaller, they build quickly, are extremely maneuverable and will fly as well or better than any other slope model, and they look real in the air! Even for the scale sailplane, Glas Flügel offers a 2.5 meter Salto, Graupner a 10 foot ASW, VS Sailplanes has a 2 meter Salto, and for the scratch builder there are numerous scale models of around 80" or smaller span.

One of the most noticeable characteristics of the scale glider is the scale fuselage. Yup, they are fat little puppies, noted by others as pregnant guppies, submarines, and any other term which equates to, "That's a fat fuselage." They may be fatter, but they do allow for easy installation of the radio, and really do not kill the performance because they are so fat. One negative aspect of the scale fuselage though is that at times it can be hard to grab on to when you need to give it the heave-ho over the edge, or up the tow line. If you're new to scale the fat fuselage is really the notable item, don't worry you'll get used to it, just like you got used to the size of your first gigantic 72" model.

Myth number four: Scale gliders fly like ____ and are hard to fly. This one goes something like this: a scale glider must fly fast, will tip stall on a sneeze and thermals on a flat field like a brick. This, as well, is all myth based on a little fact. The scale model like any other model will have flying characteristics dependent on many factors: the airfoil, wing loading, tail moment arm, etc. A scale model just like any other "sport model" will fly based on how it's been designed and built.

The very first aspect you should look at when considering a scale model is not only how great looking a scale glider an aircraft would make, but also the design parameters of the real aircraft. The Wik Salto is an aerobatic and fast sailplane, and you can expect a model built to its scaled down dimensions to fly likewise. A vintage Slingsby T21 was more of a floater type, has a real thick airfoil, and a moderate aspect ratio; it would be a very comfortable model to fly. The DFS Reiher, a gull wing vintage glider, in its day and even today is an extremely sophisticated design, high aspect ratio gull wing; this model will need to be flown faster and will require concentration.

Now, I know these are just generalizations, and that those of you who are more aerodynamically knowledgeable will be able to put this into more accurate terms of Reynolds numbers, etc. You, might also want to check Wil Byers' column in the September '92 *RCSD*, for a more detailed and scientific look at scale models. Okay, so before you build or purchase a model, reflect on the real aircraft's attributes; are those the qualities you are looking for? From there you can step to the model. If you are scratch building you really can make a significant change in the design and thereby change how the model flies. Do you want low speed or high (a high lift, or low lift airfoil)? You could build a Wik Salto with a nice Clark Y on it for slower

flying speeds, less wind penetration, and average inverted performance, or you could slap an RG15 on it and have a rocket. Not to wear this to the bone, but just like any sport model the scale model will perform according to how it's been designed and built; weight and airfoil being big determinators.

Scale models, generally because of their higher wing loading, need to be flown faster. Hopefully, most of you out there, thanks to articles by Martin Simons and seeing the latest contest models in the air, have found that weight does not make a poor flying model, and that it can be an advantage. Today's thermal contest models are proof of that. Typically a wing loading of 10 oz./sq. ft. is light for a scale model, 13 to 16 seems to be average, and numbers up to more than 24 are seen on the large 1/4 or 1/3 scale models. Again, this high wing loading does not hinder these models but instead brings out the best in high performance soaring efficiency. On the larger sailplanes, just like many of the sport models, spoilers and or flaps are a great advantage for nice soft landings.

On A Side Note: Today, flaps are definitely in and spoilers are out. Flaps are wonderful devices, but spoilers are effective when you know how to use them. How often I've heard modelers complain how they hate spoilers because the nose drops and the speed of the glider increases, just when you don't want that speed as you're heading for the landing circle. Well, if that is your complaint guess what? You have not been using your spoilers correctly. Proper use of spoilers to kill altitude without gaining speed requires that you apply up elevator too!

If you can handle an intermediate slope ship with ailerons proficiently, then there are plenty of PSS models that you can fly, and fly well. Low aspect ratio wings love the slope and the wind, and though maybe not scale in a roll rate that's a blur, are nonetheless fun. And, those low aspect ratio wings of many of yesterday's and today's fighter aircraft will give you just that, speed and maneuverability as well as fun. Another facet of the PSS models not found in other classes of soaring are the bomber or passenger aircraft; these models, like the B-52 bombers or 747 airliners, with their higher aspect ratios wings, can deliver praise worthy light air performance.

As you can see, scale gliders are no different than any other radio controlled model aircraft. Yes, you can spend a lot of money on one...Yes, you can build a huge one...Yes, you can spend a 1000 hours building one, and Yes you can have one that flies rotten. When choosing scale for your flying enjoyment, you can also have a model of modest cost, that will fit in the trunk of a car, that took say 40 hours to build, and that flies like a dream. No, I can't guarantee you'll be hooked for life, but you will have a model you can be proud of, that will attract attention at the field, and best of all will make you feel higher than a kite when it passes overhead. **So, forget the myths! They are simply that!**

If you're interested in scale, I suggest you consider joining NASSA, an organization dedicated to the furtherance of scale soaring in North America.

Glas Flügel, P.O. Box 2121, Coeur d'Alene, ID 83816

Graupner kits: Hobby Lobby, 5614 Franklin Pike Circle, Brentwood, TN 37027

Icare Models, Etienne Dorig, 381 Joseph-Huet, Boucherville, PQ, J4B 2C5, Canada

VS Sailplanes, 2317 N 63rd, Seattle, WA 98103

Bob Holman Plans, P.O. Box 741, San Bernardino, CA 92402

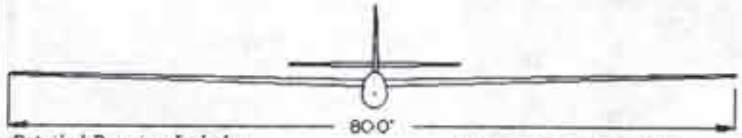
NSP, 16 Kirby Lane, Williston, VT 05495

Viking Models USA, 2 Broadmoor Way, Wylie, TX 75098

Robbe Modelsport

NASSA, 3540 Eastlake Dr., W. Richland, WA 99352 ■

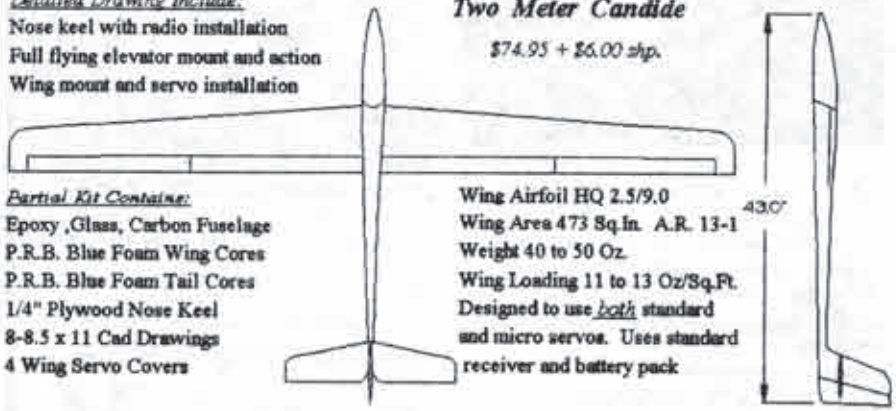
Scotts Models.....*Presents*



Detailed Drawing Include:
Nose keel with radio installation
Full flying elevator mount and action
Wing mount and servo installation

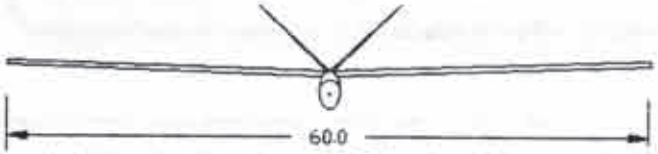
Two Meter Candide

$74.95 + $6.00 shp.



Partial Kit Contains:
Epoxy ,Glass, Carbon Fuselage
P.R.B. Blue Foam Wing Cores
P.R.B. Blue Foam Tail Cores
1/4" Plywood Nose Keel
8-8.5 x 11 Cad Drawings
4 Wing Servo Covers

Wing Airfoil HQ 2.5/9.0
Wing Area 473 Sq.In. A.R. 13-1
Weight 40 to 50 Oz.
Wing Loading 11 to 13 Oz/Sq.Ft.
Designed to use *both* standard and micro servos. Uses standard receiver and battery pack



Detailed Drawings Include:
Removable, Adjustable V-Tail
Structural Composite Wing Closeout

Tehachapi Mountain Slope Soarer

$49.95 + $6.00 shp.

Partial Kit Contains:
Epoxy, Glass, Carbon Fuselage
P.R.B. Blue Foam Wing Cores
P.R.B. Blue Foam Tail Cores
15-8.5 x11 Cad Drawings
4 Wing Servo Covers

Wing Airfoil HQ 1.5/8.5
Wing Area 338 Sq. In. A.R 11-1
Weight 24 to 32 Oz.
Wing Loading 10 to 13 Oz/Sq.Ft.
Designed to use *both* mini and micro servos. Uses standard receiver and battery pack.

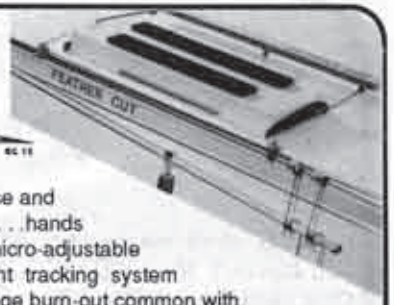
T.M.S.S. Ployheadral Hand Launch Glider, SD 7037 Airfoil, Standard Tail $59.95 + $6.00 Shp.

Other Products Include:
Vacuum formed .020" styrene *wing servo covers* .250" depth. Four covers and drawing $3.00 inc.shp.
Jack Chambers hand launch airfoils. Twelve wing foils with sixteen tip foils and chart, $15.00 inc.shp.

Scott Metze P.O. Box 1569 Tehachapi, Ca. 93581 PH. 805-822-7994

HOT-WIRE FOAM WINGMACHINE™

FEATHER CUT



"FEATHER CUT" creates a new standard in the ease and accuracy of cutting white or blue foam wing cores . . . hands off! Precise single wire tracking in concert with micro-adjustable balance weights guided by an exclusive three-point tracking system guarantees ripple-free surfaces. No more trailing edge burn-out common with two wire systems. Couple "FEATHER CUT" with Tekoa's "THERMAL GENERATOR" for fool proof temperature control and you'll be a "Pro". . .first time out.

• Cuts straight or taper wings, fins and stabilizers — automatically. • Mounts with tape to the edge of any workbench, even your dining table and stores in its own heavy duty mailing tube. • Complete kit with anodized and plated components - no hardware store trips. • Instructions include "cutting your first wing", "making templates" and more. • 28" fold•bow, 40" and 52" available. Power supply required. • Guaranteed to out perform the rest. • "Simply" the best!

FEATHER CUT
$149.50 + 8.50 S&H
THERMAL GENERATOR
POWER SUPPLY
$119.50 + 4.50 S&H

TEKOA: THE CENTER OF DESIGN
3219 CANYON LAKE DRIVE
HOLLYWOOD • CA • 90068
PHONE 213•469•5584
FAX 213•469•3006

NEW! ALUMINUM "FOLD•BOWS"
8' SPOOL "T370" HOT WIRE $3.00

28" FOLD•BOW $29.50
40" FOLD•BOW $34.50
52" FOLD•BOW $39.50

Race-Proven Performance

Highly Prefabricated Kit Requiring Little Assembly

60" Span Class Slope Racer

RENEGADE

- High Quality Molded Epoxy/Fiberglass/Kevlar Fuselage With Slip On Nose Cone
- Vacuum-Bagged Composite Wings Featuring Blue Foam Cores Fully Skinned With Carbon Fiber And Glass Cloth
- Pre-cut And Hinged Ailerons With Servo Bays Cut Out
- Bolt-On Wing And Tail Surfaces

The Renegade is the new "Bad Boy" on the Slopes of California, sporting a blatant disregard for anything in its way. This Rock n' Roll plane is designed to win slope races (and does!) in the new 60" span racing class. The RG-15 airfoil gives the Renegade a blistering speed range and the ability to carry a massive ballast load if needed. Its flaperon system cranks the plane through high-G pylon turns with little energy loss. Don't let Renegade's bad attitude scare you off because it is very stable at all speeds and has remarkable light lift flying ability. This rugged plane gives you big plane speed at a small plane price.

Fly with an attitude, fly a Renegade.

Specifications
- **Airfoil: RG-15**
- **Wing Area: 420 sq. in.**
- **Wing Loading 13.0-22.0 oz. per sq.ft.**
- **Two Channel: Flaperon / Elevator**

Designed by Charlie Richardson © 1993
Distributed by C.R. Aircraft Models

High Performance C.R. Sailplanes

- **RENEGADE PREFAB KIT → $249.95**
- **California Residents Tax → 7.75%**
- **Shipping & Handling → $ 6.00**

*prices subject to change without notice • orders shipped U.P.S.

C.R. Aircraft Models • 205 Camille Way • Vista • CA • 92083 • 619 / 630-8775

THE HOTTEST TOOLS AVAILABLE

If you've used top quality tools then you know the value of having them, if you haven't, then it's time you did. We now carry the Olfa line of tools. Olfa tools are the best we have found yet. The quality and longevity out weigh all others and the price is still reasonable. In the picture: Top left - Rotary Cutter. Top right - Notch Cutter. Center - Craft Saw (complete). Bottom - Combo Knife/Saw. Not shown is the 24x36 cutting mat, a must for fiberglass and monokote cutting. The blades are made of Tungsten Steel for long lasting sharpness.

RTY-1 Rotary Cutter	$9.98
CS-2 Knife/Saw Combo	$12.98
PNC-1 Panel Cutter	$15.98
CS-3 Craft Saw	$19.98
RM-MG Cutting Mat	$37.95

Spare blades and accessories available.

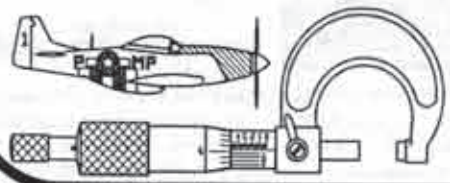
Shipping not included.

We will mail or fax to you a detailed description of each product upon request.

Other Products Carried by P.M.P.

The Precision Plank Building Board - solid, exotic wood in two sizes 72x24x1-3/8 inches @ $104.95 and 60x20x1-3/8 inches @ $ 79.95 (shipping not included).Comes to you presealed and can be used on both sides. With care, it will last you for many years.

The Sure Grip Building Pin. - A VERY SHARP, hardened steel shank cast directly into a solid aluminium head. Press it in by hand or smack it in with a hammer, it won't bend or break. Three sizes available, each in boxes of 100. SG38 - 3/8", SG12 - 1/2", SG58 - 5/8" (shank lengths). Price per box $5.98 (shipping not included). A great addition to the Precision Plank or other wood building surface.



Precision Modeling Products
3591 Hearst Drive
Simi Valley, Ca. 93063-3236
TOLL FREE: 800-847-2451
FAX: 805-581-6006

A Multichannel Thermal Duration Sport Sailplane...

Controls: *All the controls of an open class ship including 90deg. flaps w/reflex; aileron differential; aileron/rudder coupling; full flying stabilizer.*

Features: *Bolt on one-piece wing; removable stabilizer; 3 micro servos and micro receiver required. Designed for a 4 channel transmitter. The Thermal Grabber does not require a computer radio.*

Construction: *Built up lite-ply/balsa/carbon fuselage; balsa/spruce stab; balsa/spruce rudder; obechi sheeted white foam wing.*

Specifications: *span-70"; length-35.5"; weight-21-26oz; wing loading-9 to 9oz. sq/ft; transition airfoil-SD7032-SD7037.*

Partial Kit Includes: *Detailed Computer drawn plans with very clear building instruction manual; Accurate white foam wing cores cut with computer generated (CNC) laser templates; Precut oversize Obechi wing skins; Wing skin sheeting tape. Full color Thermal Grabber wing sticker.*

Partial Kit Price is ***$48.00 (US).*** *Shipping charge is extra. For orders outside the continental US please phone or fax for shipping costs. FAX 201-366-0549*

The Thermal Grabber is now available with the **AVION** epoxy glass fuselage! for an additional **$65.00 (US)**. See the **AVION** ad in this issue of RCSD!

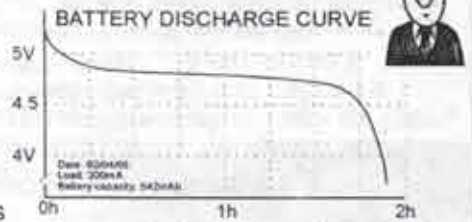
"Another Wright Manufactured Product"

Available exclusively from
SLEGERS INTERNATIONAL
201-366-0880 (8:30am-5:30pm EST)

WRIGHT MANUFACTURING CO.
P.O. Box 3231 / Bellevue, Wa. / 98009 / 206.455.9559

PRINT YOUR OWN DISCHARGE CURVE!

Detect weak batteries before they cause problems!



You can do this with your computer and the Ultimate Battery Analyzer - the most powerful battery analyzer available to the hobbyist. It analyzes your rechargeable batteries and actually displays and prints their discharge curves!

- Analyzes 4 to 9 cell NiCd packs and 6V gel cell batteries from 10 to 10,000mAh.
- Gives battery capacity in milliampere-hours.
- Includes software and manual.
- One year full warranty.
- 30 day money back guarantee.
- Radio specific cables available.

Note: The UBA requires an IBM PC or compatible or PS2 with a serial port.

Introductory prices:	List	Now
Single channel UBA	$149.95	$99.95
Dual channel UBA	$219.95	$149.95

USA and Canada: add $10 S&H.
Foreign: add $15 S&H. Prices in US funds.

For a free brochure or to place an order call or write to:

Vencon Technologies
5 Graymar Ave., Downsview
Ontario, M3H 3B5, Canada
☎(416) 398-4534
FAX (416) 921-7480

VISA

SLEGERS INTERNATIONAL

Route 15, Wharton, New Jersey 07885

(201) 366-0880 - FAX (201) 366-0549

8:30 A.M. - 5:30 P.M. (Closed Sun. & Mon.)

Slegers International is the Sole U.S. Distributor for M.A.P. of France

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

AURA 2

M.A.P. 2 M F3E for 10 - 27 Cells

- ★ Kevlar and Carbon Fiber Fuselage
- ★ All-Moulded Hollow Core Fiberglass Wings
- ★ Composite Stabs
- ★ SD7003 Airfoil

M.A.P. **is one of Europe's leading manufacturers of all-molded and composite electric and non-electric sailplanes.**

19 PLUS - *1.8 M*
M.A.P. Electric or Non-Electric
★ Glass and Carbon Fiber Fuselage ★ All Composite Fiberglass Wings & Stabs ★ RG 12A Airfoil

IMAGINE - *2.35 M*
M.A.P. Electric or Non-Electric
★ Glass and Carbon Fiber Fuselage ★ All Composite Fiberglass Wings & Stabs
★ RG 12A Airfoil

MAESTRO 7 - *2 M*
M.A.P. Electric or Non-Electric V-Tail
★ Glass and Carbon Fiber Fuselage ★ All Composite Fiberglass Wings & Stabs
★ E 211 Airfoil

AS22 - *M.A.P. 4 M*
★ Glass and Carbon Fiber Fuselage ★ All Composite Fiberglass Wings & Stabs
★ HQ 2.5 Airfoil

Send your name & address and we will add you to the list for our Free Catalog which will be available in June.

Having a hard time getting props, spinners, and adapters? Call Slegers International. Most 7 - 10 cell props, spinners and adapters in stock and at reasonable prices!

★ VISA ★ MASTERCARD ★ AMERICAN EXPRESS ★ DISCOVER

GENESIS
Designed by RnR Products

Rich Spicer and Rich Tiltman, RnR Products, manufacturer a unique line of sailplanes for the sailplane enthusiast. Their designs are especially well known for outstanding F3B, Slope, and Cross Country performance around the world. Genesis is an all-molded design for everyone from the serious contest pilot to the average sport flyer, and is available exclusively from Slegers International or direct from the manufacturer. Additional information on their sailplanes is included in this publication.

GENESIS
Thermal - Open Class
★ High Quality, all-molded epoxy fuselage ★ High strength, low weight, three piece, hollow core sandwich wing ★ Interlocking wing panels ★ Molded in color, no painting required ★ Slip-on nose cone ★ Integrated skin hinged ailerons ★ Carbon fiber composite spar ★ Rectangle carbon wing joiners ★ Servo wiring installed ★ Parabolic wing planform with SD-7037 airfoil

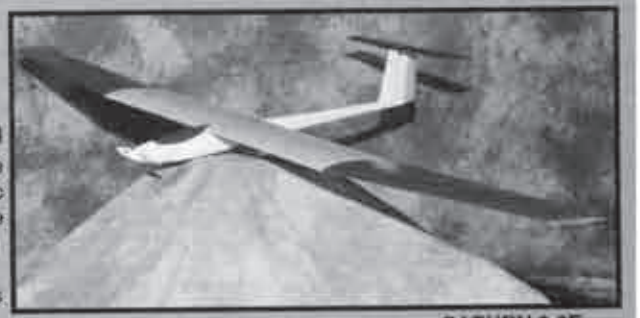
New Products Recently Added

Astro Flight...*Motors, Chargers & Speed Controllers*
RnR Products...*Sailplanes*
Wright Manufacturing Co...*Sailplanes*

★ VISA ★ MASTERCARD ★ AMERICAN EXPRESS ★ DISCOVER

SATURN 2.2E
A Layne/Urwyler Design

Layne/Urwyler manufacturer a fine line of Saturn Sailplanes. Their first electric design, the SATURN 2.2E, is available exclusively from Slegers International or direct from Layne/Urwyler. Additional information on their sailplanes is included in this publication.



SATURN 2.2E
Thermal for 7 - 10 Cells

★ Ultra light epoxy glass/kevlar fuselage featuring an all molded motor mount for precise motor alignment, and a molded stab mount to insure perfect incidence ★ Strong, yet light and practical, three piece wing featuring precision cut foam cores, a light weight spar, and obeche skins ★ Great climb speed under power and thermal performance you would expect only from a traditional sailplane ★ Strong enough to fly at high speed, and through aerobatic maneuvers without risk of wing failure ★ HQ 2.0/9 - 2.0/8 Airfoil

SLEGERS INTERNATIONAL

Route 15, Wharton, New Jersey 07885 (201) 366-0880 - FAX (201) 366-0549

8:30 A.M. - 5:30 P.M. (Closed Sun. & Mon.)