R/C Soaring DIGEST

February, 1993
Vol. 10, No. 2

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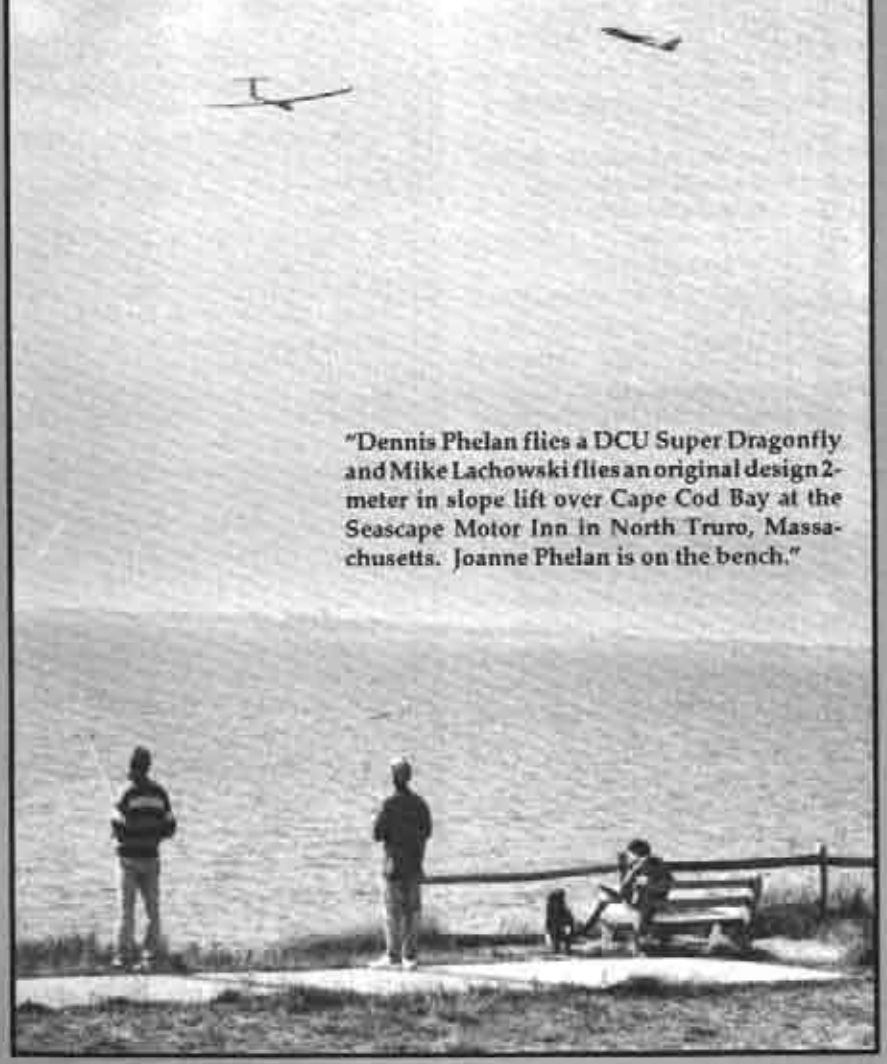
"Why Are RC Sailplanes So Addicting?"

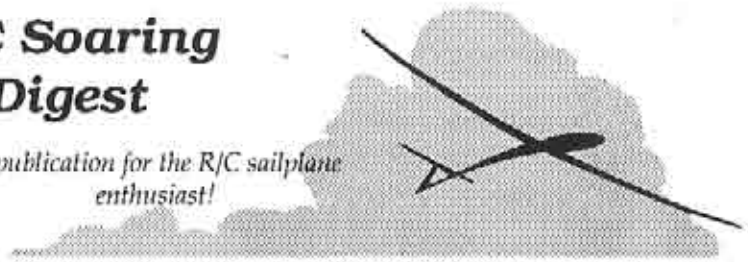
David D. Garwood shares the results of his in-depth study on page 42.



"Dennis Phelan flies a DCU Super Dragonfly and Mike Lachowski flies an original design 2-meter in slope lift over Cape Cod Bay at the Seascape Motor Inn in North Truro, Massachusetts. Joanne Phelan is on the bench."

R/C Soaring Digest

A publication for the R/C sailplane enthusiast!



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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.

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Did you hold/sponsor/CD a club contest this last year and offer T-shirts, sweatshirts, decals or even jackets? Did you wind up with extras collecting dust in a closet? Would you like to sell them to help your club out or at least get your closet back? Why not let the readers know by dropping us a note with the details on what is available, pictures or drawings (if applicable), price, colors, size(s), shipping, etc. We'll include the information in *RCSD*.

Composites Structures Technology (CST)

The new address for CST is 2090 Andre Ave., Los Osos, CA 93402; Order Desk - (800) 338-1278 or Technical Support - (805) 528-4875.

TULSOAR

Dale Nutter, President of the Tulsa (Oklahoma) RC Soaring Club (TULSOAR), sent in a copy of the TULSOAR newsletter. He says, "We have 36 paid members and are growing fast. We plan to hold three AMA sanctioned contests and attend many major meets in 1993. Six of us are entered for the Phoenix (Arizona) meet."

"TULSOAR had an active booth at the Tulsa Model and Hobby Show last month. Enclosed are photos of our booth and of the swap meet area. We also had an active contest year. Enclosed are photos of the 1992 Wichita, Kansas (WASA) and National (LSF) Championships contests."

The photos are shown on the next page. If you are not familiar with TULSOAR and are local to the area, Dale can be reached at 7935 S. New Haven St., Tulsa, OK 74136; (918) 492-3760.

From New Mexico

Taylor Collins sent in the photos of Dave Thornburg and says, "The photos were taken on November 1, 1992 at the F3J

Contest held at the Albuquerque Soaring Association field at Edgewood, New Mexico. The club is flying off the abandoned runways of the old Edgewood Soaring Ranch... a full size glider operation. The modified F3J contest was held to stimulate interest in the newest of the FAI events... and Frank Weston of WACO generously provided a Magic kit to be raffled off to the participating pilots. The kit was won by John Ihlein of Albuquerque. The contest was halted after one complete round of flying... Winds gusting up to forty knots cooled everyone's ardor.

Tulsa Model Hobby Show overview... Dale Nutter.

TULSOAR booth at Tulsa Model & Hobby Show. Jim Stephenson explains launch techniques to visitors. Winch system (TULSOAR club) at left. Jim's blue-white-red Sagitta, etc., on wall. Doug Drullenger demos Falcon 880 to a crowd. TV video of soaring at far right... Dale Nutter

Dave Thornburg, owner of Pony XPress, publisher and author of "The Old Buzzard's Soaring" book and "Do You Speak Model Airplane?" ...Taylor Collins

Wichita, KS (WASA) contest in 1992. TULSOAR members were 50% + attendence... Dale Nutter

Below: Legends, etc., at LSF Nationals... Dale Nutter

(And everything else! Temperature was in the low forties!) Contest Director, Taylor Collins, launched his 20 year old Legionair on a high start... The plane was immediately 150 feet *behind* the launch point... as the plane gradually inched its way into the wind... the line parted company with the high start rubber! The line and parachute took off east towards Texas...and were never seen again! Dave Thornburg launched his venerable Bird of Time (the wings of which were built for the World Championship F3B event in Belgium [1979??]... **Do you think these guys need some new airplanes?** One entire outboard wing panel parted company from the rest of the plane, but Dave was able to regain control and land the remaining aircraft parts without further damage."

We also received a note from Dave regarding his books. He says that he is currently out of "Buzzards" and that the "Speak" book "has almost nothing in it about R/C soaring". However, we know that some of you will be most interested in obtaining his book(s) based on past telephone calls and notes, so drop him a line at the Pony XPress address: 5 Monticello Drive, Albuquerque, New Mexico 87123. Or, contact Taylor Collins at (505) 898-1129.

If you're interested in obtaining more information about the Albuquerque Soaring Association, the Editor of the newsletter, *What's Up?*, is Lucas Jones, and he can be reached at 6806 Mossman Place NE, Albuquerque, New Mexico 87110-2139; (505) 883-0769.

Happy Flying!
Jerry & Judy

Jer's Workbench

Mold Making Part II

Last month we covered the plug and lay up tray. Now, we are ready to start the actual lay up of the mold. The time required to complete this project is going to be a week to ten working days. Don't think too much about the time required as most of it is curing time necessary for epoxy resin.

Figure 1 Release Agent Frekote 1711 & Bet'r Surface Coat BE-115.

Figure 2 - Plug with surface coat

Figure 3 - Plug & surface coat are coated with epoxy resin and silica fillet.

To start, there will be several items required; a list of some places where the material can be obtained will be included at the end of this article.

Mold Release & Surface Coat (Figure 1)

First item used will be the mold release agent. I'm using a product called "Frekote 1711". This comes in a spray can, is easy to use and works very well. Be careful not to get any runs when you spray on the Frekote mold release. If you do, they will appear in your mold. Just rip the run off and spray again.

Figure 4 The first layer of fabric is laid on at a 45° angle.

Next step is to apply the surface coat. The surface coat is a two part epoxy. This will make a hard, long lasting working surface inside of the mold. The product that I'm using is Bet'r Pattern Products, BE-115 surface coat. It has a density hardness of 88, with a pot life of 45 minutes. Also, it's like working with peanut butter, but it will mix fairly easily and can be brushed on. When brushing on the surface coat, be careful not to get any air bubbles, but if you do, just brush them out.

OK. Now mix the surface coat and brush it onto the plug (Figure 2), and about 3 inches beyond. As it is brushed on, it will very slowly flow out. When completed, let this cure overnight or for about 24 hours.

Figure 5 The second layer of fabric is laid on at an angle opposite to the first layer.

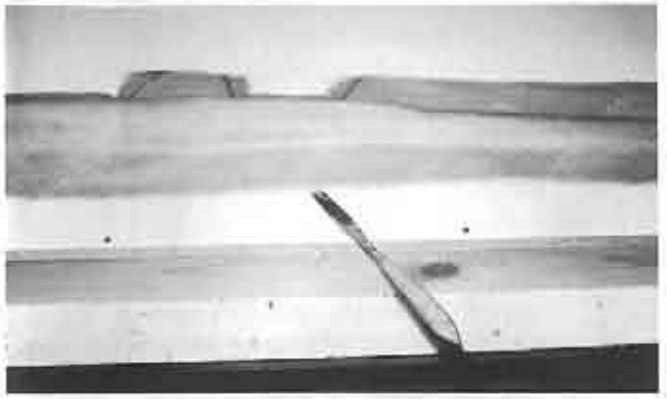


Figure 6 After 8 layers of fabric are completed and it is fully cured, remove from the tray by using a long thin putty knife. Carefully pry up the edges.

Figure 7 - Keys used for alignment

While the surface coat is curing, take about 5 yards of 7.5 oz. fiberglass fabric and cut into strips about 4-5 inches wide; they will be easier to work with later on.

Epoxy Resin & Silica

The epoxy resin that I'm using is West System 105 resin and 206 hardener, by Gougeon Brother's, Inc., along with some Colloidal Silica for a thickening agent. At this time, I mix a thick batch of resin and silica and brush it over the surface coat (Figure 3) also building a fillet at the bottom edge of the plug where it mates to the tray. Then, I lay the fiberglass fabric strips onto the plug. Note in the picture that the fabric strips are laid at a 45 degree angle (Figure 4) to the center line of the plug. When laying these strips of fabric they should only butt up to one another; don't overlap. Don't worry if there is a gap between these strips as the next layer will cover the gap. After the first layer is complete, start the 2nd layer, but rotate the strip of fabric 90 degrees or 45 degrees the other way to the center line of the plug (Figure 5). After the 2nd layer has been completed, let's take a break for a couple of hours before adding 2 more layers. I only do four layers a day. The next day repeat the same as before until there are a total of 8 layers of fiberglass.

After this first half of the mold has cured for 72 hours, it's time to remove it from the tray. To do this, run a long, thin knife around the edges of the mold and, with a little luck, it should pop off of the tray (Figure 6). If it does not release, turn the tray over and dig out some of the caulking until the mold half comes off of the tray. Be careful that the plug does not come out of the mold half. If the plug pops out a bit just push it back into the mold.

Now, clean off the rest of the caulking and, using a Dremel, Moto-Tool, grind in some keys for alignment as seen in Figure 7. Alignment keys are placed about every 8 inches. After the keys are completed, repeat the above steps and do the 2nd half of the mold: mold release, surface coat and 8 layers of fiberglass. See Figure 8.

Plywood Frame

While the 2nd half of the mold is curing, make a 5/8ths" plywood frame (Figure 9) around the edges of the mold. The reason for this plywood frame is to keep the mold from warping and a place to install the T-nuts. After the plywood bits are cut, trimmed and epoxied onto the mold, drill a 1/4 inch hole about every 4 inches(Figure 10). Install bolts, washers and T-nuts. See Figure 11. Using a saber saw, trim off the rough edges. Remove all of the bolts and you should be able to see the parting line between the two mold halves. Using a small wedge, split the mold apart. Remove the plug and you will see your mold. Figure 12.

Figure 8 - Completed halves of mold

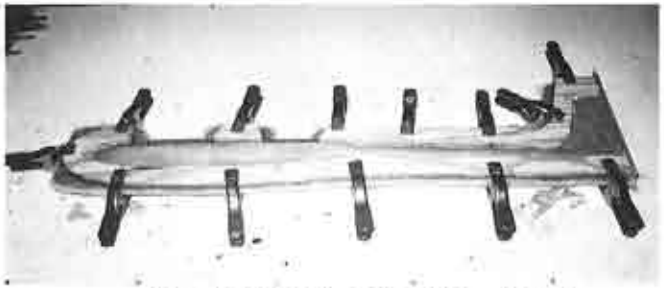


Figure 9 Epoxy 5/8" plywood frame to mold.

Figure 10 1/4" bolts are installed every 4"

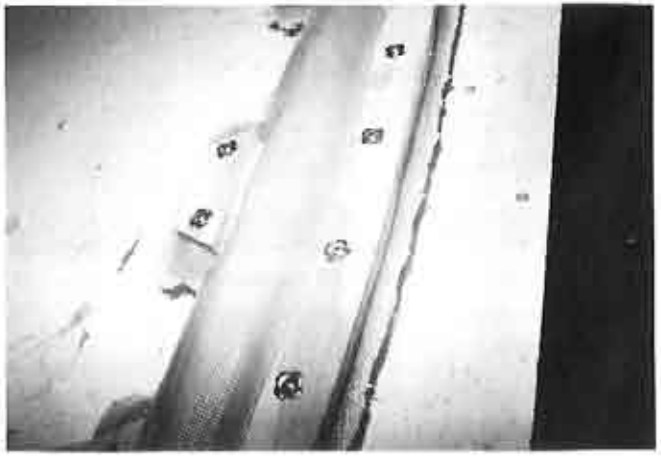


Figure 11 T-nuts installed

Figure 12 - Molded edges trimmed and unpolished

Figure 13 - Trimmed access holes

We are almost done. Bolt the two halves of the mold together and, using a moto-tool with a drum sander, trim the edges off the access holes (Figure 13) and add some small feet onto the mold so the it will sit flat on your workbench. See Figure 15.

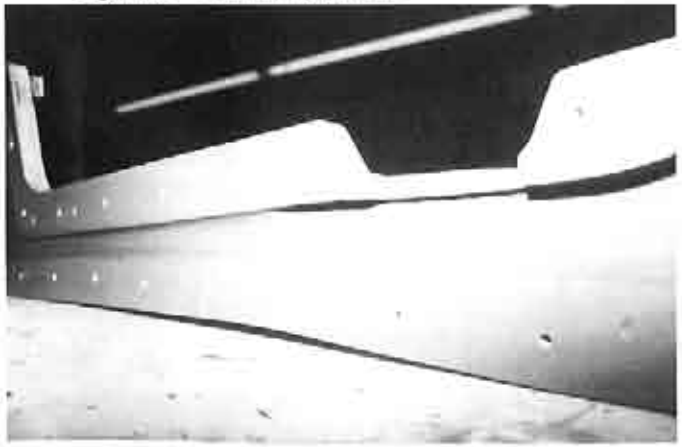


Figure 14 - Polished mold

Now, the last step. Open the mold, again. Using rubbing compound, start polishing. How long do you polish? Until you are satisfied. After you are satisfied that you have a smooth surface inside of your mold, you add 6 more layers of parting wax, buffing between each layer until you are done. See Figure 14.

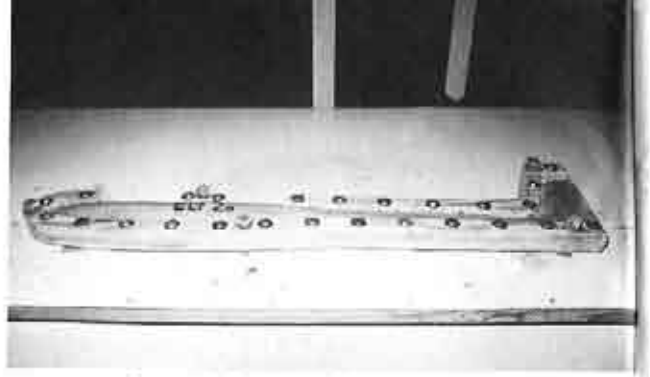


Figure 15 - Completed mold. Note the small feet which allow it to lay flat on the workbench.

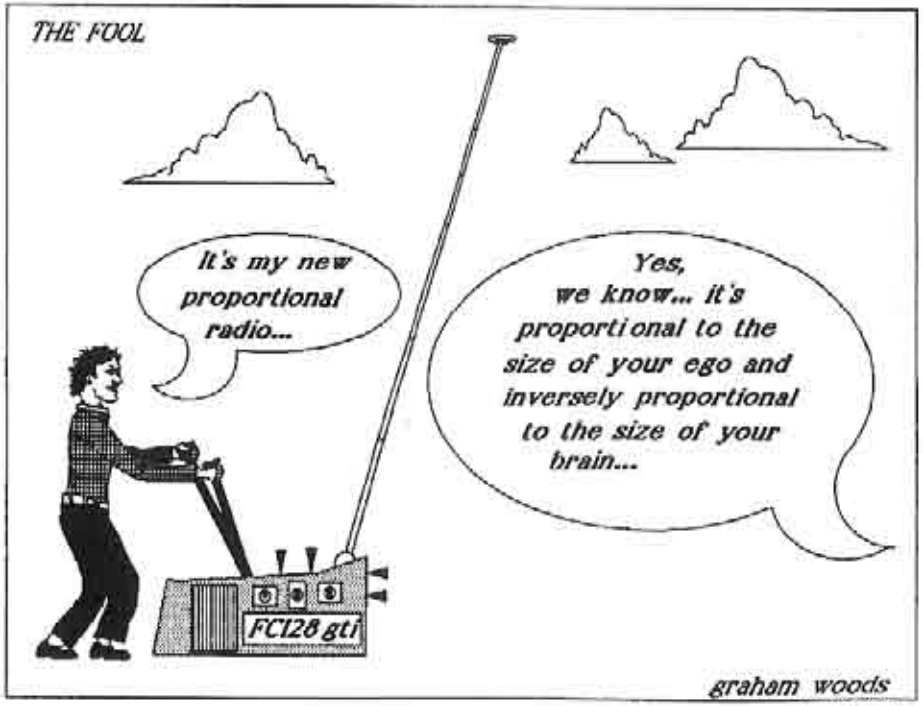
Sources

Local Home Depot - 1 inch brushes, Acetone, 1/4" X 20 X 2" bolts, 1/4" washers, 1/4" T-nuts, 5/8' plywood

Fibre-Glast Development Corp.
1944 Neva Drive
Dayton, Ohio 45414-5598
(800) 821-3283
Frekote 1711, 7.5 oz. fiberglass fabric, Parting Wax Paste #11

Gougeon Brother's, Inc.
P.O. Box X908
Bay City, Michigan 48707
(517) 684-7286
West System Epoxy Resin 105, Epoxy Hardener 206, 406 Colloidal Silica

Porter Warner Industries
2800 N. Nichols
Fort Worth, Texas 76106
(800) 433-2150
Bet'r Pattern Products BE-115 Surface Coat ■



Dynamic Soaring

Graham Woods
19 Mimms Hall Road, Potters Bar, Hertfordshire EN6 3BZ, England

(The July, 1992 issue of *RCSD* contains an article on the subject of Dynamic Soaring by Graham Woods in England. We received a FAX regarding this article from Peter Brown of Anchorage, Alaska. Peter says, "I have to admit being baffled a bit by Graham Woods article in the July '92 issue about Dynamic Soaring. However, I can report that the subject is not unknown to pilots of full scale sailplanes. Helmut Reichmann's classic soaring text "Cross-Country Soaring" contains a simplified but comprehensive section on dynamic soaring wherein he argues that the technique is more than theoretically useful to extract energy from the wind in zones of significant wind shear."

"I remain a skeptic at this time, but Reichmann maintains that either a climb against the wind through wind shear or a glide downwind through a wind shear will result in an increase in total energy (potential and kinetic). He reports of one particular flight in Tocumwal, Australia in 1974 when conditions on the ground were near calm as a result of an inversion to an altitude of 300m. Between 300 and 400m, the wind picked up to 40 kts. and, by alternately climbing against and diving down wind, a pilot was able to maintain altitude for 70 minutes, and later, with practice, able to work upwind of the release point."

"This wind shear equates to about .2 m/sec velocity per meter of altitude and Reichmann reports that scientists have calculated that a shear of 1/7 of this value, 0.03 m/sec/m, would be sufficient for dynamic soaring of a full sailplane with performance comparable to a Nimbus."

"Although our R/C sailplanes will not come close to approximating the performance of full scale craft, we do spend time flying slopes very close to the ground where the shear is strongest, only a meter or two along the ridge. My guess is that the rate of change in wind velocity with altitude that we experience when ripping along low and then pulling up or out from the ridge, may well push us into the strength of shear necessary to achieve some practical energy advantage when racing."

"I would like to hear Martin Simons' and Graham Woods' thoughts on this."

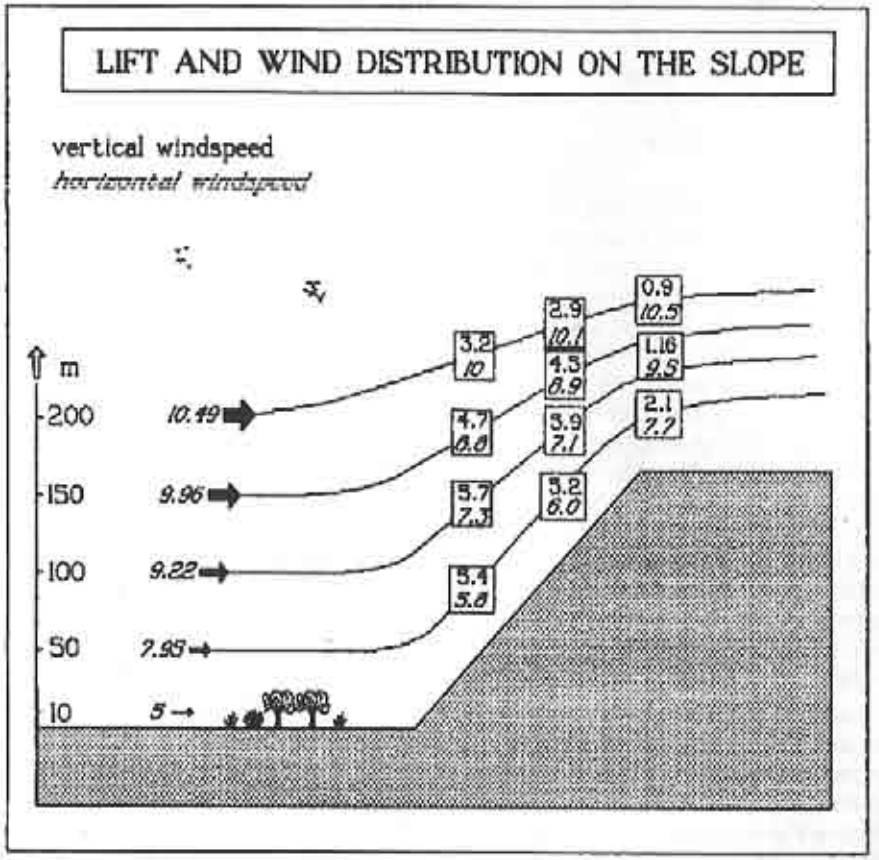
A copy of Peter's FAX was forwarded to Graham Woods and a second copy was held until Martin arrived in the U.S.A. While Peter has received correspondence from both Martin and Graham, we wanted to share their responses with you. Graham's response is included here and Martin's is included in his column, "Understanding Sailplanes". This subject has caused another reader to go digging through the archives of a local library. Ernie Barter of Saratoga, California has expressed interest in this subject, as well. ED.)

Dynamic Soaring

I was a bit baffled by my article, as well; I don't hold myself up as some university professor, just an inquisitive slope soarer. However, any discussion of dynamic Soaring is impossible without some math. It was a long article using references I found over a period of months. My task was to try to pull the information together and make some sense of it.

Your letter, Peter, is really a confirmation of what I wanted to happen: for experienced fliers to take on the notion that Dynamic Soaring may well be possible and illustrate it with anecdotal evidence and personal experience.

My full-size knowledge is limited to a couple of experience flights and the reading of a couple of books on gliding. I never came across the text you mention (Helmut Reichmann's book on "Cross-Country soaring"). Perhaps you can give



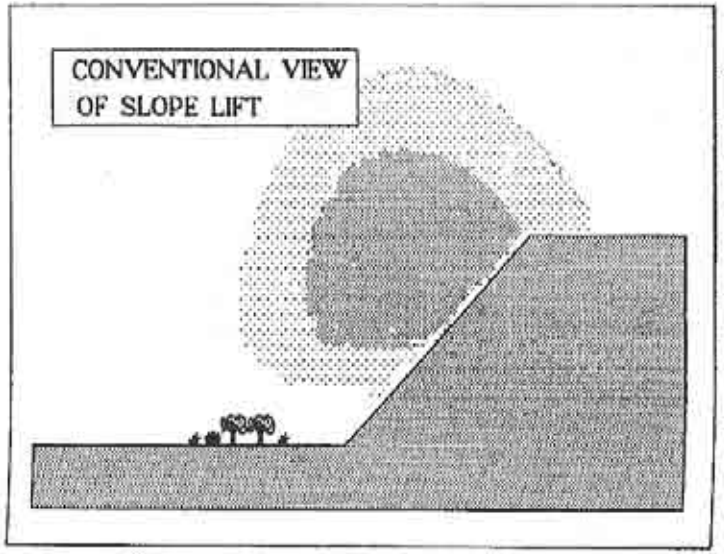
me the title/publisher/pages so that I may order a photocopy from the 'British Library' which holds a copy of almost everything ever written.

I think it's fascinating that a full-size pilot believed that he was extracting energy from the wind, flying in the windy air above the inversion and dipping below it into calm air. This coincides with what I wrote when I suggested that an R/C model could possibly fly above a hedgerow in the wind and dip below it in the 'shadow" of the hedgerow. In 1883 Rayleigh used the idea of 'planes of separation'. I doubt he knew anything much about temperature inversions or had any accurate way of measuring wind speed at altitude.

The figure of 0.2m/sec seems a low value of wind shear to gain some benefit, but more surprising still that scientists suggest that with a wind gradient of 0.03m/sec/m, a Nimbus could gain energy from the wind. It looks as though the scientists have gone over Dynamic Soaring, before. I'd like a look at Reichmann's text. Perhaps a precis by you might be interesting to readers of *RCSD*?

Moving on to R/C slope flying, it was the F3F flight path which started me thinking about Dynamic Soaring, but this isn't strictly true. I may have already come across it, without realising, when doing right and left stall turns across the slope.

Imagine a day when the wind is about 10 mph and there are no thermals about; launch off and the model climbs out to a regular height determined by only the wind speed and 'shape' of the slope in a minute or so. Now, come down to launch height without any excess speed (as if you'd just launched), and start doing



stall turns left and right. You may find that with each stall turn that the model will climb higher and then higher still, and you may get to the situation where you have reached a height higher than that first time. Alternately, start doing consecutive loops and you may find that they get faster and faster or you can make them larger and larger.

On the slope, we can find places where the wind speed varies considerably, but having never made any measurements, I can only guess as to what happens as we zoom around from place to place. We R/C modellers are at a tremendous advantage over full-size since we can come down to within a metre of the ground without risking life and limb.

To illustrate what I mean, I have enclosed a diagram I've been working on of a 'theoretical' slope and the sort of vertical and horizontal wind speeds we might expect to find at tens of metres around the slope. As I said, having never made any measurements, I can't say what is really happening, but it seems that flying fast and very close (<5m) to the slope, there is some benefit. Trouble is, there is always some slope lift and often thermal lift, so one can't say categorically that we are Dynamic Soaring and what value of wind shear we need and what values are available.

I'm pleased that you took the time to write and I, too, would like to hear what Martin Simons has to say. He may, of course, shoot me down in flames. No matter; it's still an interesting subject and I hope will provoke some debate; pity those albatross at the other Pole can't tell us how they do it! ■

Understanding Sailplanes

...By Martin Simons

13 Loch Street, Stepney,
South Australia 5069

Dynamic Soaring

The possibility of dynamic soaring by full sized sailplanes and by models has always excited a lot of interest. I write now in response to earlier articles and letters by Graham Woods and Peter Brown.

Observations of the albatross soaring over the sea were made long ago, even before Coleridge's famous poem about the ancient mariner. It was remarked that these magnificent birds, when soaring with wings outstretched, would follow an undulating, flight pattern, rising, turning, descending, turning, rising again, in a fairly regular series of cycles. They would climb steeply into the wind, reaching a height of at least several metres, before, at the top of the ascent, banking steeply round and gliding down until close to the water. They would then face the wind low down and skim over the surface, before pulling up again, reaching about the same height as before but, apparently, having made some headway against the breeze. The birds, without wing flapping, could keep pace with, and even overtake, ships as they ploughed the trade routes.

It seemed evident to the first scientists who saw this flight pattern that the birds were extracting energy from the air without wing flapping, and an attempted explanation came from Lord Rayleigh in 1883. He remarked that, because of friction of the wind with the surface of the sea, the air low down must be slower than that some little distance above. Although the term was not used in those days, he was correctly describing the boundary layer of the earth's atmosphere. A bird flying in the slow moving airstream near the water could, by increasing the angle of attack of the wings, pull up a little distance, so rising into the faster flow above. This would briefly increase the bird's airspeed enabling a further gain of height and this in turn would bring it into the even faster moving air higher again. The bird could thus rise until it came close to the upper limit of the boundary layer. It could then turn

Cycle description

Point	Time seconds	Airspeed m/s
A	0.0	20.00
B	0.36	20.13
C	2.08	18.96
D	2.74	17.97
E	4.65	15.43
F	6.08	22.32
G	6.86	26.44
H	10.00	26.91
J	21.55	19.99

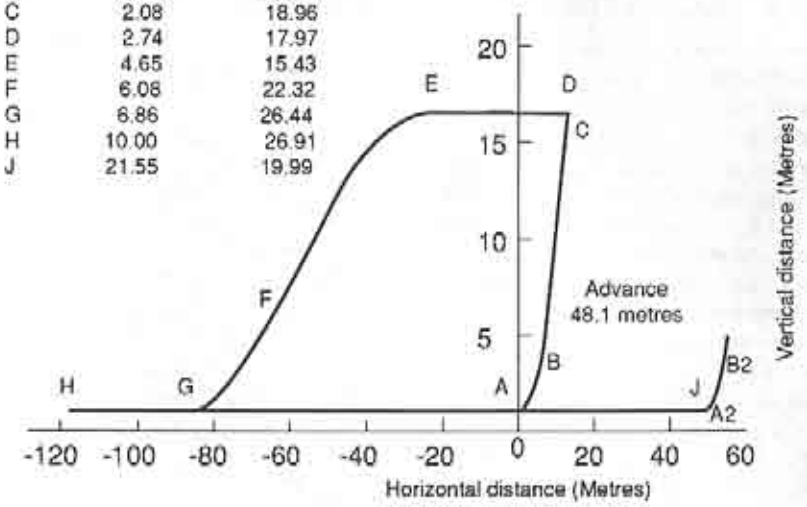


Figure 1

C. J. Wood's computer simulation of dynamic soaring by the albatross. At point A the bird is flying into wind at 20 m/s airspeed, at 1 m above the water. It pulls up at B, enters the faster airstream and so climbs to about 16.5 metres height, losing a little airspeed to 18.96 m/s at C.

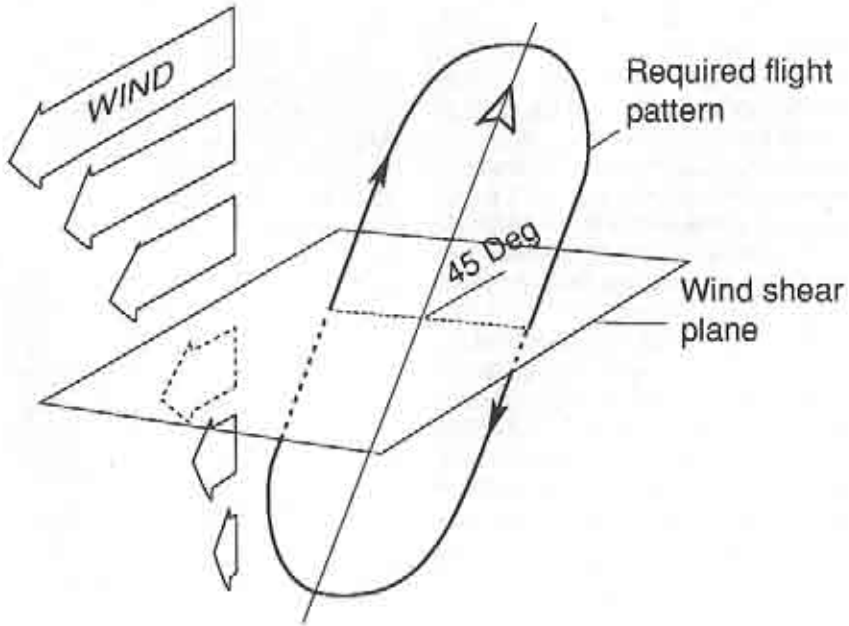
At D it turns downwind, loses airspeed in the turn to 15.43 m/s at E. It then dives to F and G where it arrives with 28.44 m/s airspeed, turns upwind at H and skims forward 1 m above the water, to reach J with 19.99 m/s airspeed, having gained 48.1 metres upwind distance.

The soaring cycle begins again at A2, B2.

Note that the whole cycle takes about 22 seconds and the distance gained is 48 metres. This is an average speed of less than 2.5 m/s which is only about 5.6 mph. The *Oriana* rarely cruised at less than 20 - 25 kts yet the albatross were capable of keeping pace and even overtaking the ship. Dynamic soaring does not seem a possible explanation.

Figure 2

Ingo Renner's diagram showing dynamic soaring where a strong wind shear exists in the atmosphere (From Australian Gliding, January 1977)



with the wind, and glide down. As it descended, in the downwind direction it would maintain its high speed relative to the sluggish air below and so, on nearing the sea surface again, it would have more energy, relative to the air, than it had at this height before. It could then use this energy to move forward over the water against the wind, before repeating the exercise. Rayleigh, and a good many others since, have shown that this kind of flying is theoretically feasible and it is widely accepted that albatross do, at least sometimes, soar in this manner.

It is important to remember that all the gains of speed and energy referred to here, are relative to the air, not to the ocean or the land. The bird can gain no energy at all from the ocean without touching it. Momentum, inertia, gains and losses of kinetic and potential energies, are relative only to the air.

Before going further, it is wise to insert a note of caution, based partly on personal observations of the flight of the albatross. I had the opportunity to do this some twenty four years ago when, with my family, I crossed the oceans on the way to Australia. (We were on board the P & O ship *Oriana* and I have never been attracted to long sea voyages since! The boredom of it!) I spent many hours, almost every day, watching albatrosses, filming them and looking specifically for evidence of dynamic soaring. I cannot say that I saw any such thing. I still have the films. (Yes! Like the ancient mariner, I shot the albatross! But it was only with a Super 8 cine camera.)

The first arguments about dynamic soaring were developed, it seems, before anyone had realised the simple principle of slope soaring. What most of the writers failed to mention, and still do overlook, is that when there is a sufficient wind over the sea for the dynamic soaring theory to work, the wind invariably causes waves, and usually quite big ones. In the major oceans even when there is no wind to speak of there is nearly always at least a considerable swell. The surface is practically never flat. (I never saw the sea becalmed, as Coleridge's mariner did. But if there is such a dead calm, there can be no dynamic soaring.)

The idea, then, of the bird skimming long distances over smooth water at a height of a few feet, before pulling up into the fast stream above, requires modification. We must also remember that the waves, raised in the first place by the wind, are in effect slopes obstructing and forcing the air to move upwards over the windward side and, on the lee side down again into the troughs. The waves do not move at the same speed as the wind, but somewhat slower.

On a windy day what the albatross apparently does is to alternate flight close to the upwind side of the waves, in the lift created by the air blowing up the wave slope, with fast glides across the wave troughs to reach the front of the next wave ahead. Viewed from the deck of a ship, they may briefly disappear below the wave crests, to re-appear just above the crest of the next wave ahead where they enter the strong upcurrent coming up the watery slope. They penetrate the downcurrent behind the wave, come over the crest and climb very steeply, rather like a model glider just launched from the top of the hill. Then, typically, the birds turn briefly along the wave to regain height in the slope lift before dashing forward to the next wave front and so on. My impression was, and on viewing my films again, still is, that while dynamic soaring may be possible, what the birds do most of their time is slope soaring over the waves, using the lift from one wave front to gain height and airspeed, before moving forward to the next slope upwind.

Certainly they can keep up with and overtake a ship, even a fairly fast one. They follow the vessel, apparently, because they have learned it is a source of food, either scraps thrown out by the cook, or because fish may be thrown to the surface by the ship's wake. Also, by slope soaring along the bow wave or even along the side of the ship itself, they can move forward against the wind very quickly without much effort. On seeing something interesting in the water, they leave the ship, which sails on without them, to investigate and possibly have lunch. They then set out to catch up again. At least, this appears to be the case, though there are so many albatross that it is not possible to identify and re-identify individuals. (Incidentally, on the same voyage, I observed many flying fish, and they do flap their wings, or rather, their fins, to extend their flights, and they can turn in the air.)

Be all this as it may, dynamic soaring is theoretically possible over a level surface and without any upward component in the wind. A computer simulation set up some twenty years ago (by C.J.Wood, writing in the journal *Ibis* in 1973), demonstrates that a skillful albatross could, in theory, in a wind of 15 m/sec (33 mph), make a gain of about 48 metres distance into wind on each cycle. The computerised bird would begin about 1 metre above the water, swoop upwards to 16 metres (52 ft) or so where it would have its slowest airspeed of about 18 m/sec (40 mph), turn downwind, descending to a height of 1 metre again and turning back into wind there. Its airspeed now would be more than 28 m/s (62 mph). It could then skim forward for a distance of 166 metres at 1 metre above the water, with airspeed decaying to about 20 m/s before beginning the cycle again with a pull up into the higher level airstream (Figure 1).

I confess, I am very doubtful if the albatross really do fly in this way. I do not think any of the birds I saw ever skimmed forward for 0.16 km (1/10 th mile) between climb and turning. I am convinced that the birds I saw were slope soaring over the waves.

But making all the allowances we can for the rather artificial basis of this computer study, I should not wish to appear totally skeptical. Dynamic soaring by birds is possible. The point that interests me particularly is why, if albatross do it at sea over an irregular and shifting surface, do we not see soaring birds doing it over level plains? What we do see, almost every day, is birds circling in thermals and birds slope soaring. If dynamic soaring is possible for birds at all, why don't they ever seem to do it over land? All the same theoretical rules apply, without the complication of waves to upset the ground skimming phases of the cycle.

In full scale flight by humans, there has, so far, been only one detailed account of successful dynamic soaring. This, mentioned by Graham Woods, was by the Australian Ingo Renner, many times World Champion soaring pilot. So far as I know, Ingo's first printed account of his experiences appeared when, as editor of *Australian Gliding*, I published his brief article in 1977. Before this, he had lectured on the subject at Aachen University in Germany. The actual flights referred to were in 1974, in Australia.

In certain, not uncommon, meteorological conditions, the atmosphere may have a very pronounced wind shear at some altitude. The wind below the shear level is relatively slight and above there is a stronger wind. These conditions are ideal for dynamic soaring. The sailplane can extract energy from differences in wind velocity above and below the shear layer and Ingo has given accounts of several flights he made in this way. It has to be noted that such soaring, while it can maintain a sailplane in flight for some time without any vertical motion of the air, cannot produce much gain of height above the shear zone, and if the sailplane once descends below it, it cannot rise back without the benefit of some other

source of lift. Ingo's discoveries do not seem to have been repeated. I have not heard that he, or anyone else, has been able to repeat the performance, but I have not spoken to him about it lately! It probably requires a World Champion's abilities, to recognise and make use of these conditions.

As far as models are concerned, we should experiment. There are of course many occasions when a little height is gained by using the extra airspeed arising when a gust strikes the model. Gusts can come from any direction, as I have tried to show in previous articles, so this kind of soaring is not dependent on wind direction or wind shear. Unfortunately, a gust is usually followed soon by a lull, when the energy gained is lost again.

There are innumerable ways in which we might use the shear effect of the atmospheric boundary layer over irregular ground, moving perhaps, as the albatross probably do, from sluggish air low down, into slope lift. A model might well use the slowing effect created by hedges, lines of trees, and other features of the country, to find layers of air moving at different rates, and extract energy from these, as Graham Wood and Peter Brown have considered. I suspect more consistent results would come from straightforward slope soaring over such obstructions, but it is worth trying.

What we really need to investigate, however, is genuine dynamic soaring over flat land where the wind remains truly horizontal. If the computer is to be believed, it ought to be possible to keep a model sailplane in the air indefinitely, this way. I have never heard of anyone actually doing it.

Maybe we should all go out and try! ■

on the Wing

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Olalla, Washington
98359-0975

Wing Blades - A Construction Project

Alan Halleck, during our recent visit to his home in Beaverton, Oregon, demonstrated a rapid method of constructing receptacles for steel wing blades. We documented the construction of a generic receptacle, and with further assistance from Alan are able to present in step by step fashion the entire process for *RCSD* readers .

Steel wing blades provide far greater vertical strength than round wing rods of the same weight, and so have a distinct advantage over them. But a common problem facing builders is the construction of blade receptacles. Alan builds very strong receptacles from plywood, an easily worked material, following the procedure described here. See Figure 1.

Begin construction by sketching the required joiner. Do this by drawing a front view of your wing at the location of the joiner. The example we present involves a blade of 3/8" height and 1/16" thickness in a wing which is 3/4" thick. The blade joins the flat wing center panel and the removable wing tip. The dihedral angle is four degrees, and the joiner is six inches long. Two thicknesses of plywood will be used during construction. One piece (1/8" in thickness, or double the wing blade thickness) is used for the main portion of the assembly, while another (1/16" in thickness, or the wing blade thickness) is used for the remainder. From the drawing we find the width of our plywood joiner before trimming must be at least 7/8" when the blade is centered within the structure. This width allows for some trimming of material upon completion of the basic structure, but minimizes waste. The receptacle length should be slightly longer than the steel blade to allow for end caps.

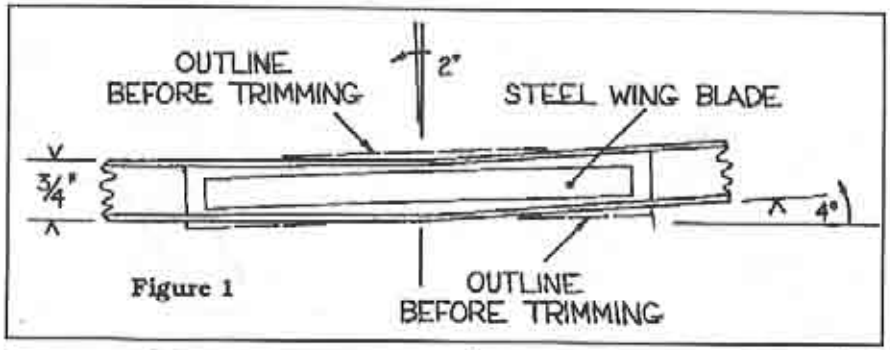
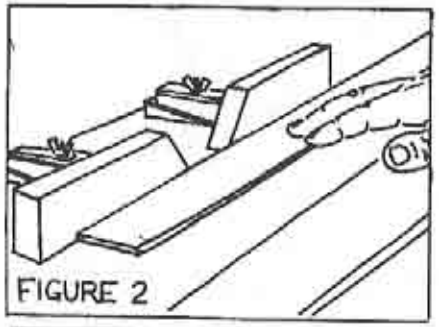
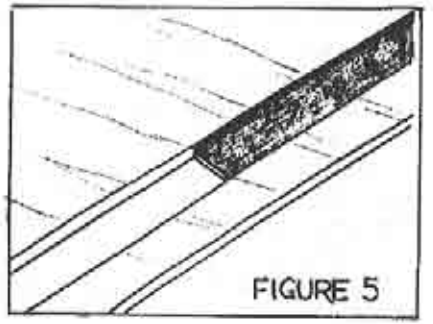
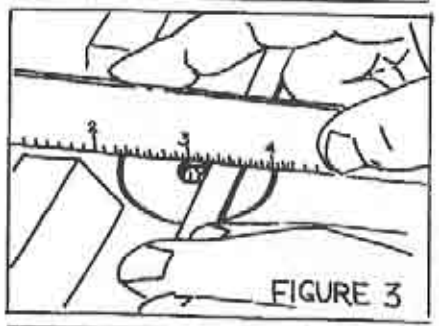
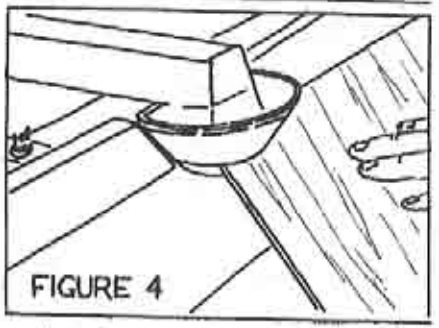


Figure 1









Actual construction starts with setting up the router table. (See Figure 2.) Use a square blade with a diameter equal to the height of the steel wing blade. (We used a 3/8" router blade to match the height of our wing blade.) Set the router fence so the plywood will be grooved at the correct distance from the edge.

Now rise the router blade to the height of the wing blade width (in the example, 1/16"), plus just a fraction more. Use a straight edge when making the final adjustments. This little bit of extra clearance prevents the wing blade from binding when inserted into the receptacle. (See Figure 3.)

The 1/8"' plywood, pre cut at a 45 degree angle to the grain, is then put up against the router fence and a groove is cut into the underside of the piece. In our example, the joiner blade is 1/16" thick, leaving 1/16" of the plywood to act as one joiner face. (See Figure 4.)

When completed, the steel joiner blade should be placed in the groove. Check the depth of the groove - it should be just noticeably deeper than the wing blade itself. Remove the steel blade. Reroute the groove a little deeper if required, otherwise go to the next step. (See Figure 5.)

Now measure across the 1/8" plywood

to the predetermined width of the untrimmed joiner assembly. (See Figure 6.)

A band saw or table saw is then used to cut the routed strip free. See Figure 7.

Place the completed piece on the 1/16" plywood. (See Figure 8.) Align the free edges and mark the 1/16" plywood using the 1/8" strip as a straight edge. Remember, the strongest structure is obtained by orienting the grain of this face piece perpendicular to the routed piece.

Cut this marked strip free, using a band saw or table saw. See Figure 9.

Spread out a piece of waxed paper or similar material to protect your work surface. See Figure 10. Alan used a piece of Crown Freezer Paper (TM). This material consists of a plastic film with a paper backing. Alan placed the plastic side up. Apply a thin coat of grease or some other releasing mechanism to the joiner blade and place it in the routed groove. Make sure one end protrudes from the eventual structure sufficiently for pliers to get a good grip on the end. Brush 5 Minute epoxy on either side of the routed groove, then place the 1/16" plywood strip on it. That's right, the wing blade should be inside the assembly during the curing process! See Figure 11.

Align the assembly carefully and weight it for a good bond. Refer to the cutaway sketch and the end view to get a clear idea of the arrangement. (See Figure 12.) When the epoxy is cured, grasp the free end of the steel wing blade with pliers and pull it out of the plywood assembly.

A tool, made from a piece of the steel blade material, can be used to scrape out any epoxy which interferes with the blade's insertion into the receptacle. See Figure 13.

Trim the finished assembly to the size and shape required, referring to your original sketches. (See Figure 14.) Don't forget to epoxy small pieces of plywood into the open ends of the channel. This will prevent the steel wing blade from penetrating the wing's foam core or the spar webbing. Wrap the entire assembly with two layers of Kevlar or Dacron thread. These wrappings should be closer together at the ends and middle of the joiner, where the plywood is thinnest and the blade might poke through. Add a filler to smooth.

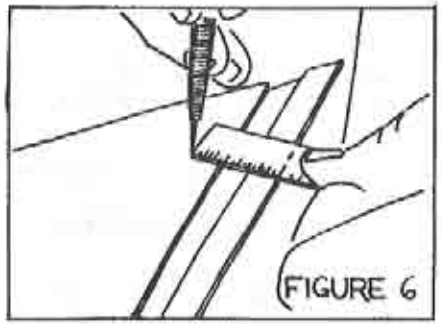
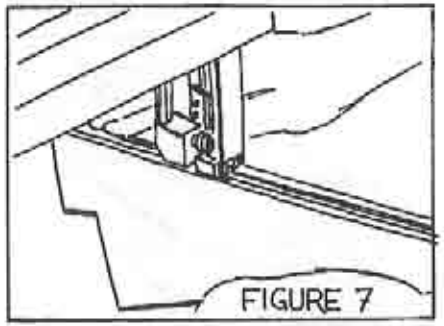


FIGURE 6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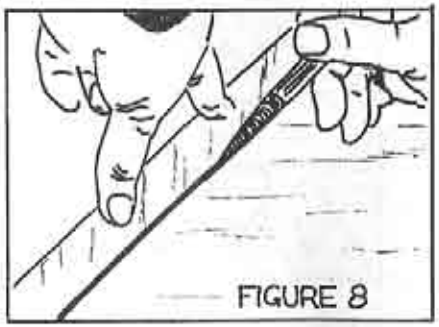
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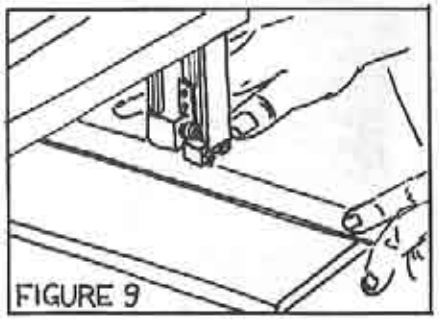
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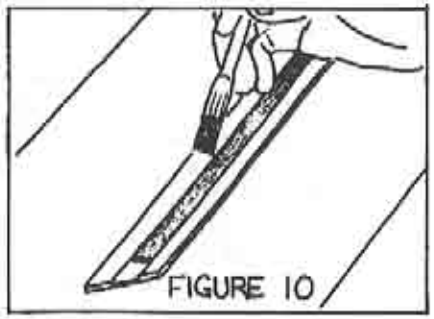


FIGURE 10

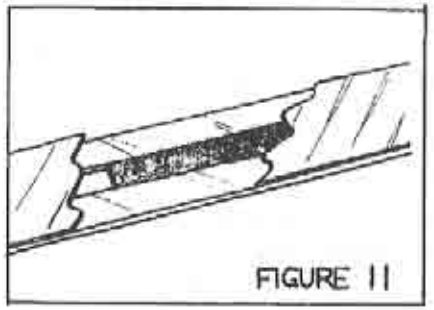


FIGURE 11

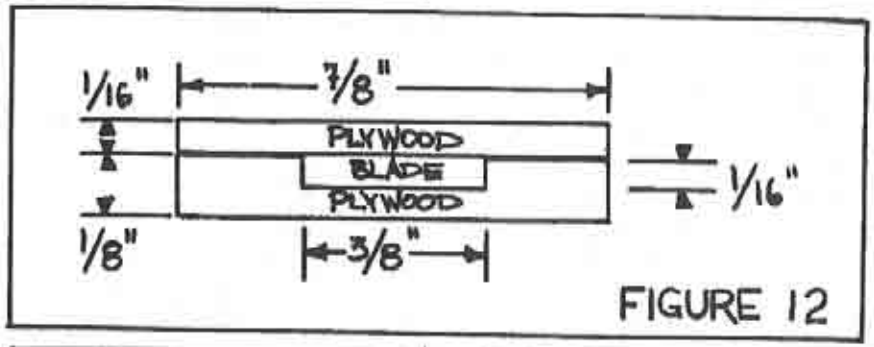


FIGURE 12

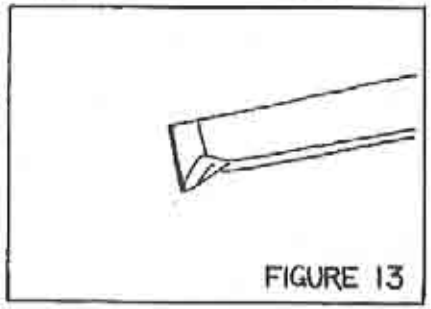


FIGURE 13

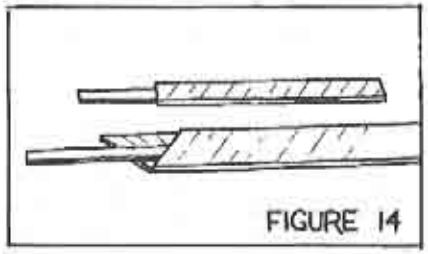


FIGURE 14

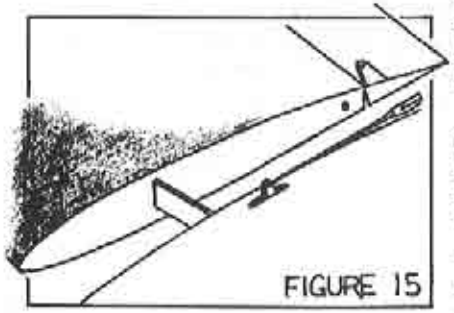


FIGURE 15

Slightly rounding the end of the steel blade will prevent the blade from scraping the inside of the plywood assembly and eventually loosening the desired snug fit.

The last step is cutting the receptacle into the two pieces required. This should be done along the angle of the wing's end caps at the separation point. Needless to say, the steel wing blade should not be inside the receptacle(s) during this procedure!

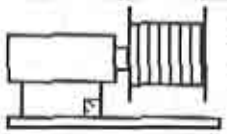
Assembly of the completed wing at the flying field consists of sliding the wing halves together with the steel blade inserted in one half. (See Figure 15.) A small music wire pin near the trailing edge assures alignment, and a strip of tape seals the gap and serves to hold the wing halves together under normal flight loads.

When installed, a steel wing blade provides a large amount of vertical strength. On the other hand, the blade is weak in the fore and aft directions. This is of benefit, for when the wing swings forward, as during a hard landing, the blade bends and slides

out of the receptacle, rather than the joiner assembly splitting open and destroying the integrity of the spar system.

Our sincere thanks to Alan for sharing this construction process with us, and particularly for his "slow motion" demonstration which gave us the time to get all of the essentials photographed and written down. Readers of *RCSD* should be able to put this information to good use.

Alan's source of spring steel suitable for wing blades is: Pacific Machinery & Tool Steel Co., 3445 NW Luzon St., Portland, OR 97210-1694; (503) 226-7656. The material used is blue tempered steel. This is available in thicknesses of 1/32" and 1/16", in widths of 1/4", 3/8", and 1/2". The cost of Alan's 8' length of 3/8" x 1/16" was $17.00. If you can not find a local source, we recommend you call or write the above mentioned supplier for an up to date price and availability list. ■



Winch Line ...by Gordon Jones

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

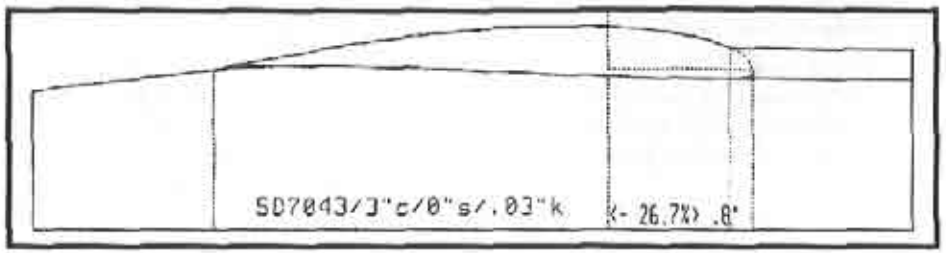
CompuFoil

Eric Sanders of Kettering, Ohio was sitting there one winters day designing his latest world beater and wanted to really do a good job on this latest creation. One design criteria that was already in place, would be the use of a foam wing to gain airfoil accuracy and ease of construction. Knowing the key to a good foam wing is the template, Eric was not satisfied with the current crop of plotting programs. Being an engineer himself, he decided to design a program to plot templates "his way".

Eric has since found out that once you embark on a project like this you can get hooked and it seems to go on forever. The designer will sit there and say, "well it would be better if I changed this or that to make it do this " every time he sits down to work on the program. Add to that the friends that "help out" by suggesting things they would like to see, and it becomes a lifelong project consuming many airplane building hours.

Compufoil and Compufoil Plus are airfoil plot programs that provide the user the basic plot options with CompuFoil, and expanded modules to change camber and thickness and combine airfoils in the Plus version. Both programs come with modifiable parameters for each template that allows the user to customize the template to fits his needs. This includes setting the depth of the centerline so that you can accommodate the various thicknesses of foam available. The defaults can be set to save commonly used variables and then are automatically loaded every time you start CompuFoil so you don't have to go through the setup process every time.

A couple of nice touches that Eric has included are the most common print drivers so that you don't have to emulate another printer but can use a driver for your specific printer. I have a HP DeskJet Plus and the resolution and speed with the DeskJet print driver makes a clean crisp template that prints out very fast. The dot matrix output is nearly as clean as laser output too. In addition, to check



your template before printing, you have the option of previewing it on the screen in high resolution. This also allows you to play around with some interesting airfoil options and get a look at the end result prior to printing. Think of the trouble you can get into with this feature!

To produce a template, you need to reproduce the intended airfoil at the chord length desired minus any sheeting thickness used. The bottom template needs to have the leading edge extended proportionally to the slope of the cut to allow for the cutting action of the wire. This is called the kerf. Compufoil allows you to set the kerf for a really good leading edge cut.

The template should also have a ramp at the leading edge and trailing edge for the wire to ride on prior to entry into the foam. This parameter is set so that the ramp takes the average slope and continues it out from the template so that greater accuracy is achieved in the cutting process.

Other features that make for a good template are having the reference lines equally spaced along the chord length to assure that the wire is cutting at the correct taper for manual cutting. Obviously making a good set of templates is a requirement for a good set of wing cores and with this program you can customize the templates to fit your method of cutting.

Compufoil is flexible enough to take care of a wide variety of airfoil configurations which can accurately and easily produce a great set of templates. It is obvious that Eric took this project seriously by doing his homework during the design phase so the he included the parameters and options that result in accurate templates. Pull down menus and mouse support allow easy use for even the computer neophyte.

Another interesting feature of the program is the ability to have the volume of the wing panel figured so that you can estimate wing weight. It provides the surface area of the panel (you can only do one panel at a time) which is slightly larger than double the area of the panel but can be a help when figuring sheeting material weight. It also provides the area of the template and some other interesting number for you to play with.

CompuFoil Plus adds some nice features to the basic program allowing the user to modify airfoils to his hearts content and even interpolate airfoils for multiple panel wings that have a transitional airfoil combination. You can change airfoil camber, thickness, and combine the tops and bottoms of different airfoils to make your own airfoil. Again you can view your creation on the screen to see how it looks and decide if you have things the way you want them.

I found the most interesting feature to be the interpolation feature. This allows you to have a root template of one airfoil, a tip template of another airfoil and build the combination airfoil in the middle for a third template. If you are going to build a multi-taper wing with more than one airfoil this is a god-send. The first one I ran off was for a triple taper wing with an RG15 at the root and a SD7080 at the tip. I used the interpolate function to build the intermediate airfoil and then verified the template on a foam panel that had used these airfoils. Using the RG15 and SD7080 templates a core was cut about 20 inches long calculating a match with the template length required for the full size chord requirement. A perfect match.

For those that are planning to use multiple airfoils in this manner I highly recommend this program. It will take all the guess work out of that intermediate template and allow you to build a more accurate wing. And when you are trying something new you would like to be as close as possible with the airfoil.

In conclusion, I found CompuFoil to be a very useful program that provides a great set of tools for the wing builder. The way that Eric has set up the program lends itself to the newcomer that will be of great benefit and make constructing templates easier. ■

Tony Palethorpe, JR.
1925-1992
Model Builder

On December 19, 1992 my friend Tony was sitting at his dining room table, working on his recently completed Lovesong. He apparently realized he was having a heart attack and called 911. By the time the paramedics arrived he had passed away. He was 67 years old.

Tony had only a small family and was somewhat distanced from them. His other family was the model building fraternity, in which he was an active and respected member. That is why I thought I'd write this piece.

Tony Palethorpe with birthday cake presented to him by members of the Sacramento Valley Soaring Society at their October, 1991 NCSL (Northern California Soaring League) contest.

Tony was a lifelong model builder and flier. He grew up with and flew with some of model aviation's most well known personalities. He flew free flight (rubber power and gas), control line, old timers and sailplanes. He was one of the founding members of the old Southern California F.A.S.T. Club. A dynamic group of control line speed and racing enthusiasts. They were the group who did the model airplane demonstrations at the original Tomorrow Land at Disney Land. He was also a member of the Academy of Model Aeronautics, the Society of Antique Modelers, the Vintage Sailplane Association and the Sierra Foothills Soaring Society.

I first met Tony in 1980 or '81. He almost always traveled to sailplane contests with his good friend and flying buddy Kevin Webb. Looking back over the years I have to admire Tony for his dedication to contest flying. Tony lived in Grass Valley, Kevin in Auburn. Since most of the contests were held down on the "flatlands" Tony and Kevin covered a lot of miles to attend the contests.

Tony was a competent sailplane pilot. He flew in our Expert Class and was proud to do so. Though he never amassed a large "win" list, he won his share of trophies and was usually pretty well up in the standings. I don't have many records on past events, but I know that in 1989 he finished in 8th place in the Northern California Soaring League Season Championships. More important than where he finished was the fact that he was always there. Tony was also always helpful to his fellow competitors. I remember a few occasions when he loaned me his plane to finish a contest after mine had become disabled. And only God knows how many times he helped Kevin out that way — even after sometimes getting his ship back in much worse shape than when he loaned it.

I referred to Tony as a model builder — I should have called him a Master Model Builder. Tony was one of the finest craftsmen I have met. His planes (and other objects he crafted) were always immaculate and accurate. He was a perfectionist and possessed the skills to produce perfect planes. He was one of those guys who could make you feel like a beginner by just setting his "average" plane down next to your "masterpiece". He had a little 1/2 A Texaco Miss America that was a little jewel — a true model airplane and a great example of Tony's skill.

Tony was also a critic. Kevin told me a story he got from Dan Lutz. Tony always said he wished he could build as good as his friend Dan Lutz. He always said that Dan was the best builder he ever knew, and was in constant envy of Dan. But every year when he would visit Dan in Los Angeles, Dan would show Tony his latest project and Tony would tell him all the things wrong with it.

Tony worked as a letter carrier most of his life but had also earned a living as a seamestre, a woodsmith, and a machinist. He showed me a child's cradle he built for his daughter; it is a work of art. Some of the finest winches ever built were the eight Tony constructed for the Western United States Soaring Championships. He sewed a very nice parachute, and once even built his own house.

We sailplane flyers will miss Tony. Remember the gentleman sitting under the sunshade, with a hat and long sleeves even on the hottest days, puffing on his pipe, a red and yellow sailplane on the ground in front of him, watching the competition and chatting with his friends.

— Mike Clancy

Ridge Writer

...by Mike Bamberg

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

This month's column will be something of a potpourri. I've been thinking of several different topics of discussion.

As you have read elsewhere in this and other magazines, there is a movement afoot to create an organization to promote scale sailplane flying and fun-fly events. By the time you will read this, the initial meetings of the North American Scale Soaring Association (NASSA) will have already occurred. In these first meetings we are attempting to nail down the charter and bylaws of the organization. In addition, we are trying to select a set of achievement awards similar to the C awards program of the full-scale soaring organizations. Even though these first meetings are over, your input is still requested. Just get together with other interested pilots and brainstorm, write it down and forward it, along with your membership dues, to the organization headquarters as noted elsewhere in this magazine. The first fun-fly is scheduled for the second weekend in July and will be occurring in the Tri-Cities Washington area.

Servo Pockets & Wiring Channels

Many of the newest sailplanes use servos installed in the wing to actuate the control surfaces. As a contract builder I had to come up with a fast way to cut servo pockets and wiring channels. The following tools and process is very useful in accomplishing this task.

The Tools

I use a 1/8 inch Dremel two flute router bit with a 1/8 wheel collar as a depth gauge. To guide the cutter I use an 1/8 inch thick aluminum straight-edge. When the depth of the route will require the straight-edge to come in contact with the cutter, I wrap a layer of masking tape around the cutter to protect the straight-edge.

The Process

I set the wheel collar depth to include the thickness of the straight-edge I will be using plus the servo thickness or wing thickness, whichever is less. I then trace the servo outline on the foam or sheeted wing and using the straight-edge and a guide, cut the servo pocket. Most of the time the outline can be free-handed and the interior foam cut away with a sweeping pattern guided by the straight-edge.

Wiring channels are cut by aligning the straight-edge along the line you wish to cut the channel, and fixing it there with a couple of pieces of masking tape. You may wish to reduce the depth of the cut for the channels since the wires come out of the servo on the mid-line.

I epoxy a 1/32 ply floor in the servo cutout and install the servo with RTV silicone adhesive. Route the wires through the wiring channel. The servo cutout can be covered with a piece of tape or other covering. The wiring channel can be covered by gluing a 1/8 square balsa strip over the channel and sanding it smooth with the surface.

Fourmost Hinges

You may have seen a press release or other information regarding the new Fourmost Snap-tite hinges. They're used to make the nice clean 'knuckle' hinge that is supposed to be aerodynamically superior. I've just completed the process of installing them on my unlimited slope racer. I have in the past used 'knuckle' hinges on about 6 planes and have used about as many ways of doing it. I installed these hinges exactly per the instructions in the package and it went great. This was a retro-fit to an already flying plane and the process took about 35 minutes for each control surface. I will be using these hinges in the future on my scale Libelle and cross-country ship. See, I do something besides just slope. But I must admit, sloping is the flying I like best.

Slope Scene

Here, in the Portland, Oregon area, we have gained access to several new slope sites this past year. One of them is in the famous Columbia Gorge near the town of Hood River. Hood River is renown worldwide for the wind and beauty of the area. This site overlooks the town and has a ten (Yes, that's 10!) acre grass landing site. This has encouraged some of the local club members to begin building scale ships. It's great to contemplate scale flying in such nice conditions. When you come to the Northwest give me a call and I'll personally guide you to the site.

Recently, I had the great pleasure to meet and get to know a fellow modeler from the Kansas area. A slope soaring pilot no less (In Kansas!!?). His name is Kevin Clark and we spent many hours exchanging ideas and stories. He also flies full size power and sailplanes and is building 5 home built aircraft. One of the most interesting to me was a new Jim Maupin (of Woodstock fame) design called, I believe, the Carbon Dragon. It uses wood ribs and spars constructed of spruce with carbon caps. The interesting part was the way the caps are built. Kevin bought these huge, by model standards, spools of carbon tow (yarn) which he mounts on a spindle. The tow is pulled off the spool, down into a container of epoxy resin, squeegeed through a set of rollers to remove the excess resin and pulled out across the top of the spar assembly. The plans show where each layer ends and you just keep packing in the layers working from the root to the tip. I think he said he uses 30 POUNDS of carbon per wing.

Well, I've got to get this off to the folks in Texas and get myself back into the shop. And if the snow will stop for awhile, maybe I'll get some sloping in! ■

Painting Fiberglass Fuselages

...by David Godfrey
Huntsville, Alabama

I have read many construction articles in the last two years in which the builder states, "The fuselage was left unpainted to keep the plane as light as possible." While it is true that not using paint causes some planes to weigh less than others, not all paints weigh the same. I have painted both a Quasoar and a fiberglass Alcyone fuse and have added only .75 oz to each of them. On my Alcyone this translates to a .11 oz/sq foot increase in wing loading.

Prior to my return to model airplanes, I was designing, building and painting custom bicycle frames. I used exclusively the PPG base coat/clear coat system sprayed over an epoxy primer. The base coat is thinned with a reactive reducer and does not have a gloss by itself. It is very thin and dries to a semi-flat finish. The shine is provided by an acrylic urethane clear coat. The advantages of this system on a bicycle frame are that the finished coat is very thin and, therefore, more resistant to chipping from rocks and does not cover intricate details, etc. Since the shine is not in the paint, you do not have to put on heavy, wet coats and make it flow to have a clean finish. When building my Quasoar, I had the necessary ingredients laying around, so it seemed natural to give it a try. The steps I used are as follows:

1. Thoroughly clean the fuse using a wax and grease remover (or acetone) and wash with hot, soapy water to remove any mold release. If the fuse is not cleaned you **will** have problems with fish-eyes, later.

2. Wet sand with 220 grit paper to get rid of the gloss.

3. Spray on a heavy coat of lacquer primer. I use a cheap spray can primer, such as Krylon for this. Fill any pin holes with a lacquer base automotive glazing compound. Put it on and use a scraper to force it into the holes. Light weight spackling and other pinhole fillers can be pulled off with masking tape, ruining your nice finish. Solvents can dissolve spackling compound causing pinholes to appear in your color coats that did not show when primed. Also, do not use cheap masking tape. Some adhesives are very aggressive and the tapes dry out, causing them to tear on removal. I use 3M brand painters masking tape, exclusively.

4. After the glazing compound dries (You can tell if it's dry by dragging your fingernail across it; if it leaves a white mark, it's dry.), sand all the primer and glazing compound off and do it again. Repeat until the fuse is free of pinholes or other voids. Take your time here and do it right. Due to the thinness of the base coat/clear coat system, it will not hide flaws.

5. When satisfied with how the fuse looks in primer, wet sand it 360 grit removing as much primer as possible. Take care not to remove too much material in areas where "body work" was required. Just clean off the primer (weight) where you can.

6. Spray the fuse with an acrylic primer sealer, using just enough to hide the glass and touch up spots completely. Note that acrylic sealer can be bought in both red and gray colors. Pick the color that will be most easily covered by your base coat color so less base coat will be used. Certain colors do not cover as well as others. White, especially, should be used on a gray sealer.

7. Apply the base coat after the sealer dries for one hour. Do not try to make the base coat shine. Only apply enough to hide the sealer. If other colors are used with a masked line separating the two, wait at least one hour before applying masking tape. Again, do not use cheap masking tape. Different colors that are faded together can be applied without waiting.

8. Inspect your color coats before applying the clear coat. Small imperfections can be easily fixed by wet sanding with 600 and touching up the affected area. Let the base coat dry at least 20 minutes before sanding or applying the clear coat.

9. The acrylic urethane clear coat is catalyst hardened and tough as nails. Apply two wet coats about 10 minutes apart. Go easy towards the tail of the fuse, but get good coverage. The clear will kick off and be dust-free in 10-15 minutes.

10. Allow to dry for 24 hours and wet sand with 600. Masked lines can be sanded smooth so they cannot be felt. If you accidentally sand through to the primer, you can touch up that area with base coat. Shoot another (last) coat of clear. Allow to dry for 12 hours before handling and you are done.

The base coat/clear coat system is easy to use and provides an excellent finish. Repairs can easily be made by wet sanding the area down to the glass. Wet sand the entire fuse with 600 grit. Touch up the trouble spots with sealer and base coat, then re-clear the entire fuse.

I have used the base coat/clear coat system on wood fuselages covered with .75 oz cloth with the same excellent results. I have also applied the urethane clear coat as the final coat on sheeted foam core wings covered with .5 oz cloth and EZ lam epoxy. The results of this are both outstanding and light weight. A friend summed it up best saying, "It looks like a freshly polished bowling alley."

Note that certain safety precautions must be taken. Use of good quality charcoal respirator and a well-ventilated room are a must. HAVE FUN! ■

Soartech Journal

...from Herk Stokely
(Soartech Journal, C/O Herk Stokely, 1504 N. Horseshoe Circle
Virginia Beach, VA 23451 U.S.A.)

For those of you who are familiar with "Soartech", it started about fourteen years ago as a series of technical papers in the Tidewater Model Soaring Society newsletter which we call TMSS Technical Journal, and which, as more material became available, was published by TMSS as the "Soartech" journal. It is an English language technical forum for Radio Control Soaring, containing papers submitted by interested modelers, and from other publications. It's intended to provide a vehicle for the publication of information and data which is too lengthy or too technical for publication in the popular press.

Selig-Donovan-Fraser

The complete results of the Princeton Wind Tunnel Studies conducted by Michael Selig, John Donovan and the late David Fraser is available as "Soartech #8" under the title "Airfoils at Low Speed". The page count for this complete documentation of the testing of over sixty R/C sailplane airfoils is almost 400 pages. Because of its size, it was originally produced commercially, as a fully bound book with card stock covers. All of the copies produced this way have been issued, and since demand has slowed considerably, future requests will be filled with Xerox copies which are, like all of the other "Soartech" issues, stapled between card stock covers. Because of its size, it's necessary to produce it in two volumes, but all of the contents are identical with the original issue.

A total of eight other Soartech Journals have been assembled. They vary in size from about 90 pages to almost 200. With the exception of Number nine, they were never professionally printed. We have used a Xerox copier to produce them, and their cost is based on the number of pages, and the costs of packaging and mailing them. All are available as Xerox reprints, though the first few issue numbers are rather poor quality. Although they are complete and readable, the first three numbers are second generation reproductions of earlier Tidewater Model Soaring Society issues whose originals have been lost.

Shipment to U.S. addresses is by fourth class (book rate) mail. If you want to have your order sent by first class (Priority Mail), add 15% to the (U.S.A.) figures. A data sheet detailing the titles and authors of the papers contained in numbers 1 through 9 is available on request.

When ordering, PLEASE provide check or money order in U.S. dollars which can be paid at a U.S. bank. U.S. cash is also accepted. Residents of Virginia should add the state 4-1/2 percent sales tax to the above rates. Sorry, but we cannot take credit card or COD orders at this time.

I currently have enough material to put out additional issues. The next Soartech will be #10. I expect it to be professionally printed and bound. It will consist of about 150 to 200 pages. I am now preparing it for publication. Its lead article will be a photographic essay by Martin Baemert covering all aspects of the creation of a complete composite model. This sixty page paper is almost completely photographic and clearly demonstrates that a single picture is worth a thousand words. The cost of this issue will be $16 for U.S. purchasers. For distribution to other countries, it will be $18 for Canada & Mexico, $20 for other countries by surface mail and $23 by air post. First class shipment in the U.S. and Virginia state taxes remain the same as for other issues.

If you want to be put on the list for this issue, you may go ahead and order it. Advance orders are not necessary, as information about its release will be published in the model press. If you do order early, it is important that you understand that it will not be in the mail at any definite time, but your early order will lock in your issue at the current price.

In February of 1992, David Fraser died as a result of an aircraft accident. In that same accident, his wife, Lee, was seriously injured, and is still in the process of recuperating from her injuries. Lee has given permission and encouragement for us to now supply the Princeton test data disk and the sailplane performance program that David developed to use the data.

Soartech is now the source for the "Airfoils at Low Speed" data disk which was edited and assembled by David Fraser. This is all of the test data from the Princeton wind tunnel tests assembled into ascii text files on a 360K IBM format disk. The price is $12.00 in the U.S.A. and Canada, and $14.00, elsewhere.

David Fraser's sailplane design performance program is also supplied on a 360K IBM format disk. It is Version 3.4 in David's development series. The program is compiled and runs on IBM compatibles. It already contains all of the airfoil data from the Princeton tests as well as several pre-entered aircraft parameter files. A complete instruction manual accompanies the program disk. The price is $35.00 in the U.S.A. and Canada, and $37.00, elsewhere. ■

Ordering Costs for Soartech

Soartech Issue	U.S.A.	Canada/Mexico	Other Countries Surface/AIR mail
#1	$10	$11	$13/$15
#2	$14	$16	$18/$20
#3	$8	$9	$10/$12
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#5	$8	$9	$10/$12
#6	$10	$11	$13/$15
#7	$8	$9	$10/$12
#8	$20	$22	$25/$35
#9	$8	$9	$10/$12

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A New Electric Sailplane

Last month I mentioned that Northeast Sailplane Products was going to introduce a new electric sailplane. A few weeks ago I received a prototype to set up and test fly. After a few minor changes to the prototype, I can definitely tell you that the plane flies great. The plane, which at this time is unnamed, is designed and built by Dave Hill. Dave is one of Hawaii's leading surfboard manufacturers and also makes the all molded 120 Predator. Dave's background in manufacturing molded surfboards shows in his construction of the electric fuselage. The white gelcoat fuselage has a finish that looks like a hand-rubbed paint job and has no visible seam line. The rest of the plane also has some neat features such as a canopy that is large enough to remove and install batteries without removing the wing. The wing is a 2 meter, 2 piece Obechi covered E387 triple tapered platform that is extremely light. The stab is built-up construction. The plane is designed for the 7-cell intermediate flier, but has plenty of room for 10 cells for the more advanced pilot.

Surprise III

The plane is complete with wing mounts and motor mounts installed; it is pre-sheeted and clear lacquered with the ailerons cut out and capped. The stab is pre-sheeted and covered. All that has to be done is to install the motor and the radio to get this plane in the air. The amazing thing is that you get all of this for a little over $200.00. If you need more information, call Sal (802-658-9482) at Northeast Sailplane Products.

Surprise III

At the other end of the price range is the Surprise III. I just received the first four Surprise IIIs from Rudolf Freudenthaler. These are the exact copies of his world champion F3E plane. (They are made from the same mold.) The Surprise III is slightly smaller than the Surprise II. The Surprise III is an all composite plane that can be flown with 7 to 27 cells. The reason for this is the lightweight, yet very strong construction. For example, the wing with servos, wires, linkages, and mounting hardware only weighs 12 oz. The plane comes with a white gelcoat Kevlar fuselage, a composite stab and a composite wing with the servos molded into the wing. I have six more coming in April, three of which are already sold. After that, there will be no more made this year. If you are interested, let me know. Unfortunately, they cost about $1200.00 depending upon the exchange rate.

Nordic Fly III

Surprise III showing servo molded into wing

Nordic III

Another neat plane from Rudolf Freudenthaler that I just received is the Nordic III. This is a 7 cell thermal duration 2 meter plane. The Nordic III has a white gelcoat fuselage and a composite fiberglass stab. The wing is a one piece, white foam, carbon fiber, and fiberglass covered with balsa. The Nordic III uses the E387 airfoil. Because of the weather, I haven't had time to fly the Nordic III, but as with all of Rudolf's planes, I'm sure it will fly just great.

Flite Lite Composites

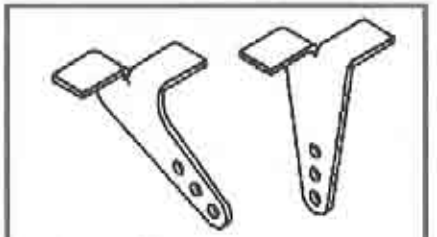
Ron Vann of Flite Lite Composites sent me one of his new T-tail 10 cell planes. As with all of the Flite Lite planes, the workmanship is excellent and, because of its light weight, I am sure it will make a good 7 cell plane. The wings are Obechi covered with the servo hole and ailerons already cut out. The stab is also Obechi covered. The nice thing about the 10 cell is the airfoil options. Ron has available at this time the E387, SD8000, SD7037, or the RG15. The choice is yours depending on your level of skill. Get in touch with Ron (707-838-9020) at Flite Lite for their new catalog and price list.

Arcus

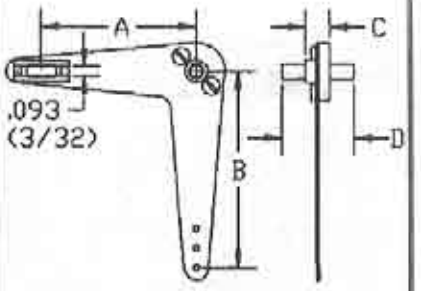
Two months ago I wrote about the Arcus. At that time, the Arcus came with a pre-sheeted balsa wing. The latest Arcus comes with a pre-sheeted obechi wing. Also, there is now a pro-Arcus. This features a fiberglass fuselage, a new and improved Obechi covered wing and a completely different hardware package. All of these refinements are to increase the performance. Get in touch with Northeast Sailplane Products for more information.

Control Horns

A few months ago I reported on some really neat servo mounts manufactured

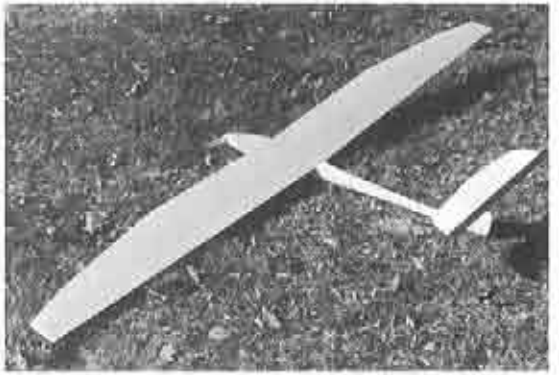


Soarcraft Horn



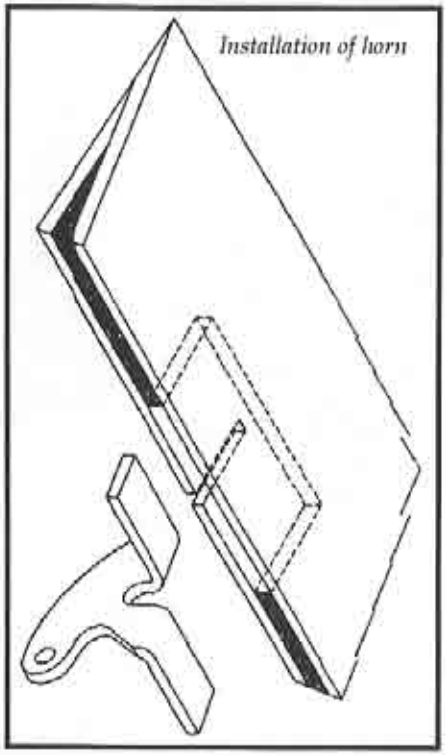
Soarcraft Bellcrank

N.S.P. Electric by Dave Hill



by Mark Gaskievicz of Soarcraft. Well, Mark has now designed some really neat control horns. Mark has been sending me prototypes to try for the last several months. After much trial and error, Soarcraft has come up with the proper horn geometry for both ailerons and flaps. I have used almost a hundred horns and have yet to find any problems with these horns. I would highly recommend them for your next building project. Soarcraft also has what may be the ultimate elevator bellcrank. Send for a catalog and price list. (Soarcraft, 615 N. Farr Road, Spokand, WA 99206; (509) 926-4803)

Good Flying! ■



Two of My Favorite Tips

...Garry Armstrong
Virginia Beach, Virginia

I'm still surprised at the number of people who are not aware of the value of using double edge razor blades for trimming monokote (or other coverings). The blade is thinner than normal single edge blades and will cut a finer line. The smallest edge may be shaved off with ease. Use wire cutters to cut some of the blades like this to make them even more useful.

A five pack will make ten blades, which is more than enough for a normal size plane. When it starts to drag, replace it. Stainless steel blades do not last longer and they cost more. Some food store chains have their own brand and are about 59 - 79 cents for a five pack.

# # #

Use a drop or two of acetone on a Q-tip to clean off any color or adhesive that bleeds over when doing multi-color monokote. This works well and is quick and easy. ■

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

BLUE FOAM, COMPUTER-CUT WING CORES. Specify airfoil, root/tip cords, LE sweep, wingspan, skin thickness. Optionally: airfoil thickness %, LE/TE sizes, spar channel dimensions, washout. $20 per pair plus $5 P&P. Chris Greaves, 92 Williamson Crescent, Winnipeg, Manitoba, R3W 1E2, Canada.

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,** 16S. Woodstock Cir., The Woodlands, TX 77381; (713) 363-3384.

VACUUM SWITCHES. A good, high quality, low differential, adjustable vacuum switch for professional-type results when bagging Glass, Balsa, Obechi, Carbon Fibre, etc...$30.00. **ONE-WAY VALVE** for use in the vacuum bagging system between the Reservoir Tank and the Pump, a must for a good sealed system...$3.50. Add $3.50 to cover S&H. Send SASE for list of other R/C related speciality items. Make checks payable to: Tom Overton, 1302 Arleen Ave., Sunnyvale, CA 94087; (408) 736-1568.

COMPOSITE SAILPLANES ARF, FOAM CORES & CUSTOM WINCH ACCESSORIES fully machined. Onboard multi-purpose computer MINI-MIXERS™ for upgrading non-computer radios: $49.00 - $69.00. Basic Aircraft Tech, Bob Harman, 10424 Golden Willow Dr., Sandy, Utah 84070; (801) 571-6406.

GREETING CARDS, humorous, assortment package in groups of 10 for the sailplane enthusiast. We have a card to fit any occasion. Send $10.95 plus $2.50 postage (CA residents please add 8.5% tax) to Curt Nehring, SOAR TOONS, 469 N Central Ave. Ste. #261, Upland, CA 91786; (714) 920-1261. Please allow 3 - 4 weeks for delivery.

For Sale - Personal

All glass Wik TWIN ASTIR, finished and flown...$450.00. Call Mark Foster at (213) 257-4573 (home) or (818) 575-5444 (work), South Pasadena, California.

6 meter ASH-25, Muller foam and Obechi wing with white lacquer, Gevault fuselage - fiberglass with white gelcoat, full span flaps and ailerons, spoilers, retracts, wheels, pilots, instrumentation, photo documentation package & 0.2 meter span scale model included. Never assembled... $1120.00. Contact Seth Dawson at (602) 497-5496, Arizona.

FALCON 880, contest proven, 4-141 & 2-102 Airtronics servos installed... $650.00 or $500.00 without servos. Contact Dale Nutter at 7935 S. New Haven St., Tulsa, OK 74136; (918) 492-3760.

Triton 1/5 scale Reiher, ready to fly w/5 servos... $550.00. Call Ray Cindric at (215) 579-1576 (5-9 p.m. EST).

ULTIMA, built and covered, never flown, individual flap & aileron servos installed in carbon re-inforced (spar and trailing edge) wing, Thermal Sniffler antenna wires installed, closed loop elevator & rudder controls... $300.00. PEGASUS, 14 ft. cross country ship, flown, good condition, includes a retract servo for flaps, balanced, nice set of pink wing bags...$100.00. Chuck Robinett, 8 Nyma Way, Succasunna, NJ 07876; (201) 584-3117 (eve).

JR MAX Computer 6 PCM, NIB...$160.00; WACO 10-550, 2 sets of cores, NIB... $75.00; 12V winch, oak frame, complete... $200.00; ALCYONE, wood fuse., NIB... $120.00; Astro Flight ASW 17, NIB... $120.00; SAGITTA 900, NIB... $50.00; QSOAR, foam wing, NIB...$110.00. Contact Ed Athey at (817) 444-1630, Fort Worth, Texas.

Glas Flugel, ASW 22B, 6.25 meter, all fiberglass and carbon fiber construction, white gelcoat, w/tandom retract (installed), 2 rudders, 2 horizontal stabs with elevators, Glas Flugel mixer, 7 Futaba S130 servos, 6 servos are mounted in wings (2 ailerons, 2 flaperons, 2 flaps), 1 servo mounted in fuse. for elevator. Wings are in 4 sections w/spoilers in outboard section. A1 shape, beautiful, very easy to transport, quick assembly. Needs 3 high output servos, 1 retract and 1 sailwinch servo (optional) to complete radio installation; 12 servos in all. This aircraft is of the highest quality; no short cuts! Asking $1500.00. Buyer must arrange shipping or will drive for $$. Contact Richard J. Szabo, 3819 E. Underwood Ave., Cudahy, Wisconsin 53110; (414) 483-7337 anytime.

VENTUS "C", Graupner, ready to fly, brand new, never used...$560.00; ASW-24, 3.8M, w/3 ea. micro servos, new, ready to fly (pictures available)...$600.00; ASW-24, 3.8M, as a kit...$350.00; CIRRUS 75, 3M, as a kit...$250.00; SATURN, 3M modified fuselage & wings, as a kit...$380.00 or, fuselage only...$90.00. UPS shipping not incl. Call Peter Zak at (305) 687-7706 Florida.

Wanted

Northern California CAD operator with software to do drawings for foam cutter. Possible Tech. manual. Contact George Hollidge, 338 Primrose, Pleasant Hill, CA 94523.

Dad, what's a Chuperosa?

A conversation with Stan and his four year old son, Alex:

Well, it's the smallest in a family of high quality sailplanes offered by Uncle Sal and Dad at Northeast Sailplane Products.

Family? Do sailplanes have brothers and sisters?

Umm, sort of. I guess that you could call the open-class Alcyone the Dad, and the Alcyone 2-meter the big brother. The new Dove could be thought of as the Chuperosa's sister. It's really a 2-meter Chuperosa with a beautiful fiberglass fuselage.

Is there a Mom? Why are they a family?

Oh, they have a Mom. The open-class Alcyone with the fiberglass fuse is the Mom, and the wood fuse version is the Dad. The real reason they are a family is that they all feature the same high level of kit quality, design excellence, and superb flight performance.

Is there a dog?

No Alex, there are no dogs in this family. The flight performance of the Alcyones, Chuperosas, and Dove is outstanding. The airfoil that Uncle Sal designed into the Alcyone works especially well. Its 7032-7037 trans-foil thermals very well, yet also penetrates great. The 7037-based Dove is a joy to fly, and the Chuperosa history of very high customer satisfaction speaks for itself. Couple the flight characteristics of this family with the kit quality and you have a group of sailplanes that represent super values in R/C soaring.

Do people that buy them like them?

Absolutely. People who buy sailplanes from this family have been so consistently satisfied that we offer a money-back guarantee on each purchase..even after the airplane is built. Anyone looking for a new kit who has not considered this family should give them a try. We feel confident about this because of our own experiences and the experiences of our customers over the years. People love 'em!

You sound like an adbatizement on TV, Dad.

Sorry, bud, but I get excited when I talk about these kits. It's easy to sound like an ad when you really believe in the quality of a product.

Uh huh...can we go get a Ninja Turtle video now?

Sure, pal.

Take home a member of the family. Call NSP today.

Northeast Sailplane Products

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802-658-9482

Chuperosa Combo

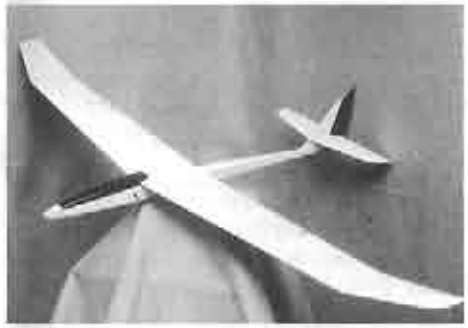
$94.95

- 1.5M Chup with a 2M wing kit
- SD7037 or E214 airfoils
- Gentle and stable flyers
- Like two airplanes in one
- Great for slope or hand launch

Alcyone

$149.95

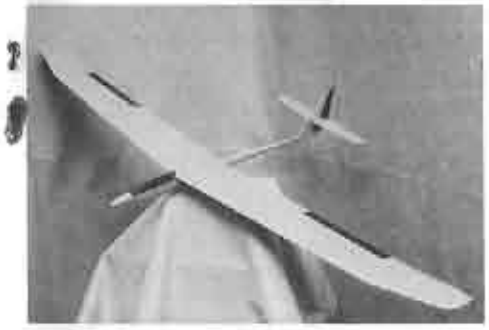
- Superb thermal performer
- 7032-7037 transitional airfoil
- Only requires 3 servos!
- Ailerons, Flaps, Elevator, Rudder
- Fiberglass fuse version available



Alcyone 2-Meter

$99.95

- Honey, I shrunk the Alcyone!
- Same great performance as big bro
- Standard servos are OK (only 3!)
- Takes a mean launch
- Also lots of fun on the slope



Dove

$114.95

- The latest family member
- Beauty and grace: the Dove
- 7037 2-Meter thermal ship
- Georgeous fiberglass fuse
- Easy and fun to fly

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

Fall & Winter 1 day seminars on composite construction techniques. Free with purchase of Weston Aerodesign plan set ($35.00) or kit. Frank Weston, 944 Placid Ct., Arnold, Maryland 21012; (301) 757-5199

Reference Material

Madison Area Radio Control Society (M.A.R.C.S.) *National Sailplane Symposium Proceedings*, 2 day conference, on the subject and direction of soaring. 1983 for $9.00, 1984 for $9.00, 1985 for $11.00, 1986 for $10.00, 1987 for $10.00, 1988 for $11.00, 1989 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. Walt Seaborg, 1517 Forest Glen Road, Oregon, WI. 53575

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

Reference listings of *RCSD* articles & advertisers from January, 1984. Database files from a free 24 hour a day BBS. 8-N-1

Bear's Cave, (414) 727-1605, Neenah, Wisconsin, U.S.A., System Operator: Andrew Meyer

Reference listing is updated by Lee Murray. If unable to access BBS, disks may be obtained from Lee. Disks: $10 in IBM PC/PS-2 (Text or MS-Works Database), MacIntosh (Test File), Apple II (Appleworks 2.0) formats.

Lee Murray, 1300 Bay Ridge Road, Appleton, Wisconsin, 54915 U.S.A.; (414) 731-4848

Contacts & Special Interest 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.

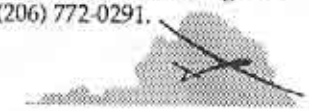
Maryland - Baltimore Area Soaring Society, Al DeRenzis (President), 5003 Wetheredsville Road, Baltimore, Maryland 21207 U.S.A., (410) 448-0808.

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

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.



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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.
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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

Why Are RC Sailplanes So Addicting?

...by David D. Garwood
5 Birch Lane, Scotia, New York 12302

"RC soaring simulates the majestic flight of soaring birds."
- Ed Slobod

Tom Fowler asked in his response to the 1991 *RCSD* reader survey, "I would like to know if there are any articles on why our hobby is so addicting. I am interested in how wide spread this addiction is in our hobby. Now that I have put together 12 planes, I have limited myself to one new plane a year to try to keep my life in balance."

Bob Powers, a 20 year veteran of RC flight, a first rate scale builder and crack aerobatic RC pilot observed, "Not many people switch from power flying to sailplanes. With me, it's with the gliders that the real addiction started. I used to build one plane a year or so; now with sailplanes I can't wait to open the next kit box."

LeRoy Satterlee wrote to me: "I fly sailplanes, indoor and outdoor free flight, power RC, and float planes. Nothing has been more enduring than my love of soaring."

When I read Tom's question, listen to Bob, and think about LeRoy's remarks I wonder why this hobby/sport is so compelling. When I'm trying to find storage space for yet another new sailplane I wonder how long my own RC sailplane addiction will continue, and wonder WHY is it so addicting?

Hoping to answer the question, I interviewed RC sailplane pilots on slopes, at thermal fields, and on the 1992 contest circuit in New York and New England. Also, I sent a survey form to soaring journalists, designers and manufacturers. Once I had the interview and survey responses this article pretty much wrote itself. Basically, I just gathered and organized the remarks of other flyers, and took a few photographs along the way.

IT'S ADDICTING BECAUSE...

"It is a challenge." said Ron Parcells, and many of the survey responders spoke to the challenge of soaring flight:

"Soaring offers a constant challenge and variety. Any hobby will get stagnant if it fails to challenge the participants every time out." - LeRoy Satterlee

"It is a challenge because one is always competing against the laws of physics." - Enrique Mertin

"Every flight is a contest between you and Mother Nature." - Ed Slobod

Related to the challenge of soaring is the opportunity to learn, and to increase personal skills:

"The merger of design, building and flying skills needed, plus the feelings of soaring and control - on good days." - Pete Young

"Launching, finding lift, staying in thermals, landing are all things that I had to learn and I can still learn better. But, I can do all of those things to some extent and they give me a sense of accomplishment. Not just anyone can do it, flying is a skill that has to be learned." - Rense Lange

"Learning to read the weather, not having power, and being able to get high." - Julio Quevedo

"Success depends not only on flying skill but also knowledge and strategy of soaring." - Terry Edmonds

Others spoke to the relaxation aspect of RC soaring:

"It's a total escape from stress." - Steve Grochowski

"It allows me to get out in the sunshine, smell the breeze and kick away from everyday concerns and problems." - Art Morgen

"Most flying happens in our minds, so it's a natural field for daydreams, a comfort we can take with us into otherwise intolerable situations of weekday life." - Dave Thornberg

Another common theme was the connection with nature, the joy of spending time out of doors, and the quest to understand weather:

"There is a fascination with the simplicity of gliders and the level that they interact with Mother Nature. RC

"Slope soaring exercises decision making and allows creativity, not only flying but designing at low cost. It's the big boy's video game." - Steve Hinderks

sailplanes involve a closer connection with the outdoors than with mechanics." - Carl Dowdy

"There's nothing to beat guiding your ship all over the sky, keeping it up for 20 or 30 minutes and then landing at your feet. It's just you, your glider, and Ol' Mother Nature." - Byron Blakeslee

"The unpredictable nature of weather. You are not guaranteed a long flight unless you HUNT and FIND lift, then USE the lift successfully. It is a game of observing nature and gaining a benefit from it. Very satisfying and rewarding." - Bill Forrey

Frequently mentioned was the grace, beauty, simplicity, and purity of sailplane flight:

"Soaring is natural grace" - Rollin Klingberg

"It's pure flight. Quiet, simple, affordable." - Byron Bruce

"There is a certain grace and beauty about things that soar. RC soaring is a way to directly participate." - Terry Edmonds

"Pure beauty of flight - association with friends of like mind - opportunity to exercise creative urges, enjoyment of outdoors - joy of always learning new things and knowing things to learn is unending." - Harley Michaelis

And finally, there is the genetic program explanation:

"Personally, it's a matter of genetics - I was born with the soaring purist gene. I'm just biologically predestined to fritter away my time in pursuit of sailplanes and thermals."
- David Manley

My hunch is that a combination of these factors comes into play as we leave behind cares, worries, and chores and head for the flying field:

"Nothing is so rewarding as to see your hand built creation, your model sailplane, circling with the birds in flight, be they eagles, hawks, swallows or seagulls. You, like them, must study and know weather conditions and the causes for such conditions." - Dale Willoughby

OTHER ADDICTIONS, ANYONE?

To try to further understand the compelling nature of sports and hobbies I asked which other hobbies, sports, or pursuits are also addicting? Eight people said "None!":

"None that I find offer the mixture of challenge, exhilaration, and satisfaction that soaring does. It's fun, even on a lousy day." - LeRoy Satterlee

"I have played racquetball for about ten years and at times I was quite fanatic about that. But not to this point, no." - Rense Lange

There were five mentions of sailing and sailboat racing:

"It's also extremely competitive and you must understand weather and the forces of nature." - Byron Blakeslee

"It's just fun, especially with a new and unusual plane." - *Louis Garwood*

"Is it addictive? A guy has to do something. If you pursue anything you should try to do it well. When I like doing something, I try to learn about it, to understand what I'm doing."
Dennis Phelan (left) and Mike Lachowski

Three people mentioned building RC sailplanes and three mentioned computer games.

Keith Schwemmer noted, "Computer gaming has enticed more than a few hours of my time, but flying still ranks number one."

Motorcycle racing/riding were each mentioned three times. Surprised at that one?

"Speed, grace, and mechanical intrigue." - Gregg Goris

"I have to work hard to keep from being as involved in sailplanes as I was in motorcycle racing." - Dennis Phelan

RC helicopters were mentioned twice:

"Attempting to thermal can be a very frustrating experience until a person encounters that first column of warmer air and begins to ascend. The feeling of going UP, of all things, is incomparable. I have found model helicopters to be equally fascinating (and equally frustrating in the beginning)." - Carl Dowdy

Three people nominated bicycling.

"But this is on the purely animal level, not conducive to daydreaming, designing, problem solving." - Dave Thornberg

"Bicycling and soaring both relax me, take away the stress of the day, and let me sleep better." - Bob DiGiacomio

Full size airplanes were mentioned twice, full size soaring four times and hang gliding three times. Fuel and electric powered planes were named several times. Each of these were nominated by one respondent: sex, running, steam powered boats, old time powered aircraft and ballooning. But the alternate compulsion named most often was fishing:

"Soaring is like fishing. When in light lift you have the same conversations as when the fish aren't biting. When wind on the slope is howling or thermals are booming, it's like hooking a marlin - same adrenaline." - Richard Jarel

"Finding fish (the strike), like finding thermals, is a thrilling and unexpected surprise. Fighting or 'playing' the fish is similar to working the thermal. Is the drag set just right so as to tire the fish but not break under the strain? Is the glider trimmed properly to climb efficiently but not stall? The parallels are endless." - Bill Forrey

"I enjoy the challenge of getting that blasted, overpriced toy into a thermal for the same reasons a fisherman will spend hours and hours waiting for a bite." - David Manley

"The reason for the addiction is the freedom derived from searching for the lift you cannot see but you know is there. Just like fishing, there is the challenge of silently searching for the best place to catch the lift that will take you higher and higher until you decide to return. At the end of the day is the extreme satisfaction of catching your limit. Even if you missed, the worst day soaring beats the best day working (to borrow a phrase)." - Keith Schwemmer

as two of my flying buddies fish; and it was David McCann, a fishermen, who pointed me to the best slope soaring hill in our area. To compare to thoughts about the fishing addiction, I asked three fisherman why they found fishing so compelling:

"It's a chance to take a break from the Monday to Friday routine; an opportunity to sneak a peek at eagles, loons, deer, bear; the challenge of trying to outwit the wily walleye; the social value in comparing notes with others who have succeeded or failed to catch fish. Fresh air, exercise, food value." - David McCann

WHY IS FISHING SO ADDICTING?

The mention of fishing as similar in many ways to RC sailplanes didn't surprise me,

"Soaring is hunting. There's always the possibility you go out and you don't get anything, but the chase is there." *- Bob Powers*

"It is relaxing, intriguing, challenging and a constant learning process. It is a way to focus your attention away from the 'work a day' world and incorporate yourself with nature and the beauty of your surroundings. The more you learn about fishing, the more you want to learn." - Ken Celmer

"It is an addiction to relaxation! You are at one with nature: the wildlife, the sky, the water. This is as much a part of the sport as the fishing itself is. There is an element of continual possibility: the quarry is always there, but unseen." - Dennis McCann

WHICH FORM IS THE MOST COMPELLING?

The final survey question was, "What types of flying do you find most compelling?" The responses fell generally into five categories:

1. THERMAL SPORT FLYING

"I find low-key thermalling with a good group of friends on a warm afternoon very rewarding." - Carl Dowdy

"Thermal flying is what I enjoy most. Scratching for altitude, seeing how long I can stay airborne, and seeing the 'bones' of my plane as the sun shines through." - Art Morgen

"Thermal sport flying of original designs to prove out attempts to improve the breed." - Ed Slobod

"I have always preferred models (FFG, HLG, towline, RC gliders) that dance with the air, rather than bully it. Slope, like U-control, never holds my attention long, but at least it doesn't make you dizzy." - Dave Thornberg

2. THERMAL COMPETITION

"Friendly competition affords an excellent opportunity for social interchange, the satisfaction of simply participating in a totally fascinating activity, and a great opportunity to satisfy creative impulses." - Harley Michaelis

3. SLOPE SPORT FLYING

"Sport slope soaring on any available hill is a joy." - Carl Dowdy

"Slope is speed, grace, and terrain kissing excitement. When lift is light, it becomes precise, close-in, and demands complete concentration." - Gregg Goris

"The ship is close to the ground and fast." - Steve Hinderks

"No mess, no fuss. You can be at the site for 20 minutes and get in 19 minutes of flying, throw it back in the trunk and you are off. You must go to the most beautiful hilltops, with the best views, and quiet scenery to enjoy your sport." - Gregg Goris

4. SLOPE COMPETITION

"Combat on the slope. There is no better flying." - Byron Bruce

"Slope Racing. Competition changes the fun into the same pressures as life, while sport flying offers a break." - Richard Jarel

"Slope soaring aerobatics. I was hooked once I realized that I could get in all the high powered aerobatics flying I wanted with no noise, no vibration, no engine problems, and no mess." - Doug Hertzog

5. F3B COMPETITION

"Speed is my game." - Dale Willoughby

"F3B does not give up. The tasks are tough and all the rules are used, not like an AMA event. I'm forced to practice to do well and that means no boring days at the field just trying to hook another cloud." - Dennis Phelan

Conclusion

The reasons given for the RC sailplane addiction are many and varied, and there's a long list of other activities which RC flyers have found compelling. The attachment to one or another type of RC soaring seems stronger and more deeply felt than I would have guessed. One more point not often mentioned, but compelling to me, is the wonderment of defying gravity with an unpowered, heavier-than-air flying machine. Rense Lang knows about it, and about why RC sailplanes are so addicting:

"There is something magical about flying a sailplane. By all rights, those concoctions of wood, metal, and plastic should not fly at all. But they do. To make them fly best, things like looking for signs of thermals by watching birds and paying attention to shifts in the wind and temperature must become second nature. All this has little to do with the cost of the plane or the equipment. It requires a quiet concentration and a determination to figure out what makes the plane tick." - Rense Lange ■

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*.

Precision Plank Building Board

...from Precision Modeling Products

Precision Modeling Products is pleased to announce the Precision Plank Building Board. The Precision Plank is the flattest and truest commercially available wood building surface. An end grain lamination is applied to an exotic, soft yet durable wood that is kiln dried and finger jointed to give outstanding performance as a model building surface. Both sides of the Precision Plank are finished and can be used to build on. The wood is very fine grained yet easy to pin into and holds pins like a vise. The Precision Plank is shipped presealed and ready to use out of the box. These building boards have been in use for 12 years, and are still being built on.

Two sizes are available: the PP1 at 72" x 24" x 1-3/8" and the PP2 at 60" x 20" x 1-3/8". The PP1 is priced at $104.95 and the PP2 is priced at $79.95. Shipping is not included. Call toll free (800) 847-2451 for shipping charges and ordering. FAX for information to (805) 581-6006. Roger Rose, Precision Modeling Products, 3591 Hearst Drive, Simi Valley, CA 93063-3236. ■

Sure Grip Building Pin

...from Precision Modeling Products

Precision Modeling Products is pleased to announce the SURE GRIP BUILDING PIN, the pin that makes building a pleasure and not a pain. Have you had a T-pin fold over while trying to pin that piece of wood? Punctured your finger lately with that straight pin because the head was made of plastic? Tired of continuously reaching for those pliers, especially when you need both hands to hold your work? NOT ANYMORE! You will not puncture your thumb when inserting these great building aids. They will not fold over when pushing them into your building board and you don't need pliers to insert them. BUT, if you want to get really aggressive you can use a hammer and pound these pins in and not damage them. How, you ask? Simple, the pin shank is made of hard steel which has been ground to a VERY sharp point and the head is made of SOLID aluminum. And that's not all! T-pins, straight pins and other straight shank pinning devices usually let the wood you're pinning come loose around the pin unless you have modified them so they won't. Not Sure Grip Pins, as the base of the head is 3/8 inches in diameter and when against the wood you're pinning, won't let the wood shift. SURE GRIP PINS are a must for your bench when building that new pride and joy.

The Sure Grip Pin comes in three sizes: SG38-3/8" shank, SG12-1/2" shank and the SG58-5/8" shank. Each size comes in a box of 100 pieces at $5.95 per box. A 20% discount is offered if more than 10 boxes are ordered (mixed sizes excepted). Shipping is not included. Shipping for one to three boxes will be $4.00 (Continental U.S.A.). Call toll free (800) 847-2451 for shipping charges on larger orders. FAX for information to (805) 581-6006. Roger Rose, Precision Modeling Products, 3591 Hearst Drive, Simi Valley, CA 93063-3236. ■

Standard Libelle

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

Viking Models, U.S.A. is pleased to announce that we are back in production, again. With our new and larger facility, we will be producing a line of epoxy fiberglass fuselages for the scale enthusiast and scratch builder who wants to design their own slope or thermal glider. Additionally, an in-house vacuum form machine allows us to produce our own canopies. If you are looking for a canopy or other vacuum formed accessories (including sailplane, power, etc.), please don't hesitate to let us know as we should be able to meet your needs. Manufacturer inquiries are welcome.

I cater only to you, the modeler, whether you are a beginner, Sunday flier or competition flier. All orders are worked on an individual basis, and there is no high volume. In this way, I feel that I can maintain the high quality control on each and every fiberglass fuselage and formed product that we produce.

At this time, I am announcing the production of the Standard Libelle. This 154" wing span, with Ritz 1 airfoil, is best suited to the slope. It is ideal for the scale enthusiast with its pleasing lines and large canopy, and many details can easily be added. This model is intended for the experienced builder. The drawings feature a fully sheeted, built-up wing construction, but custom foam cores are also available.

Kit Features

- Epoxy fiberglass fuselage 58.5 inches long with a canopy frame and clear canopy
- Drawing with Photo-Pak documentation & 3-View
- Does not include wood or hardware

Price is $135.00 without foam cores or $195.00 with foam cores (wings & stabs). S&H in continental U.S.A. via UPS is $20.00. Texas residents please add 7.25% sales tax.

For more information on our other products, please send for our new, free catalog. Or, if you're near Wylie, Texas, please feel free to drop in as visitors are always welcome.

Viking Models, U.S.A., Jerry Slates, 2 Broadmoor Way, Wylie, Texas 75098; (214) 442-3910; FAX (214) 442-5258. ■

Custom Core Cutting Services

...from RA Cores

Official supplier of Gremlin R/C combat short kits. Wing core sets $12; wing core and fuselage $20.

We'll cut any wing if you supply the root and tip airfoils and the wing planform. Or, select an airfoil from one of many Selig, Eppler, Quabeck and NACA airfoils on file. Sheeting thickness can be allowed for and washout can be cut in upon request. Using virgin 1 pound expanded bead white foam and 1.5 pound gray extruded foam.

Replacement wings for most popular trainers or gliders. Sheeting method instructions/suggestions included with each core set. Club kit projects. Design a club glider, racer, or trainer project. Vacuum bagging services available.

Checks and money orders accepted. $5 S&H charge per mail order or delivery to local club meetings can be pre-arranged. Call today for quote on your specific project: RA Cores, P.O. Box 863, Southbridge, MA 01550; (508) 765-9998 (leave a message on the machine). ■

Motors, Peak Detectors & Electric Flight Videos

...from Astro Flight Inc.

Astro proudly announces its new **Cobalt 90 Motor.** The 90 is specially designed for smaller quarter scale models of 1000 to 1400 square inches of wing area and a gross weight of 12 to 16 lbs. The Cobalt 90 is only 2 inches in diameter and 3 1/2 inches long and weighs 28 ounces. The Cobalt 90 is a real powerhouse and is designed to run on 32 to 36 nicad cells.

Motor Bench Test Results

Cells	Prop	RPM	AMPS
32	16x8	7000	30 Amps
32	15x10	7000	30 Amps
36	16x8	8000	35 Amps
36	15x10	8000	35 Amps

There are several quarter scale models now flying with the Astro Cobalt 90 motor: Bob Benjamin's Ace Big Bingo, Tony Fiori's P-51 Mustang, and Keith Shaw's Percival Mew Gull. Other models like the Great Planes Ultra 1000, the SIG 1/4 Scale Space Walker and Dave Patrick's new Carl Goldberg Finesse 120 pattern kit would also be good candidates for the Cobalt 90.

Astro has upgraded its model 207 Speed Control to handle 36 cells for the Cobalt 90 motor. Astro will release its new Model 112PK peak detecting charger for 36 cell in January 1993. The Cobalt 90 motor is now available. See your dealer or order direct. Please allow 30 days for delivery.

In response to the unending quest for more speed, Astro has responded with a new series of **Super Hot Five Turn Racing Motors.** All these motors feature armatures wound with Five Turns of #18 gauge wire. The windings are tied with Kevlar and slot wedges are used to keep the windings in place, even at very high speeds.

Astro has upgraded its Model 110A charger to handle up to 16 cells. The new **Model 110XL** can charge any nicad battery containing 4 to 16 cells from a 12 volt automobile battery or 12 volt power supply. The new Model also comes with a built-in cooling fan and both input and output are fuse protected. The Model 110XL will be available in early January.

Astro has completely redesigned its popular Model 112 charger to incorporate Peak Detection and at the same time has increased its capability. It can now charge up to 36 cells. The new **Model 112PK** features electronic protection of both input and output against overload and polarity reversal. Other features include an aux 100 ma trickle charge so pilots can top their radio packs while they charge their motor batteries. The Charger also has a built-in cooling fan.

The following Electric Flight Videos are now available:

"Let's Get Serious About Electric Flight" by Bob Benjamin. This 29 minute video features the Astro Viking 035 powered old timer, the Astro 25 powered Porterfield on floats, and 05 to 60 powered sport scale and aerobatic models in flight. Stock number #4052.

"Keith Shaw at the 1992 KRC Electrifly". Dave Grife captured the highlights of the 1992 KRC Electrifly in his 29 minute video. The scenes of Keith's twin ducted fan Horten flying wing are truly amazing. Stock number #4055.

"The 18th Annual Astro Champs". This year, a new event, Electric Payload, was sensational. Chuck Hollinger won the event by lifting 10 lbs 4 ounces of lead and kept it aloft for one minute. This was done with a single Astro FA1-05 geared motor and a seven cell 1200 ma battery pack. Chuck's winning model weighs about four pounds empty and has a 100 inch wing span. The video includes seven cell pylon racing between top fliers like Jerry Bridgeman and Steve Neu, scale competition featuring multi-engine scale models like the Partenavia P-68 twin, the Tri-motor Beardsmore Inflexible World War I Bomber, Bruce McAvenew's winning B-24 four engine World War II Bomber, and electric powered 30 and 40 Helicopters. Stock #4056.

Astro Flight Inc., 13311 Beach Avenue, Marina Del Rey, CA 90292. ■

The Climmax Hand Launch Thermal Glider

...from C.R. Aircraft Models

Charlie Richardson, designer of the outstanding Turbo, Excel, and Contender slope glider kits has released "Climmax", a 60" span Hand Launch Thermal Sailplane. Climmax was designed to win A.M.A. hand launch duration events although the plane has turned out to be an excellent slope performer, as well.

Extensive wing R&D and flight testing lead to a specially designed transited SD-7037 airfoil with full aerodynamic washout and swept tips. This planform improved Climmax's upwind and launch penetration ability and eliminated any tip stalling tendency. Another unique feature of the Climmax is the high aspect ratio full flying rudder which gives the plane incredible turning torque and sensitivity. These design features give the thermal pilot the highest possible launches in any conditions and the ability to circle tight and flat in the smallest thermal bubble and then cruise quickly upwind to find new lift.

A surprising result has been how Climmax performs in slope conditions. The full flying rudder makes the plane roll like an aileron ship and the SD-7037 lets Climmax accelerate to speeds not thought possible with such a light plane. The prototypes were commonly looked over by other pilots to find those hidden wingeron or ailerons and lead ballast. This is a must have plane for those days when the thermals are popping or the slope lift is marginal.

Specifications

Airfoil	Transition Modified SD-7037
Wing Area	400 sq. in.
Wing Loading	5.0 - 6.0 oz./sq. ft.
Flying Weight	14 - 16.5 oz.
Two Channel	Rudder & Elevator

Machine Cut Balsa, Spruce & Plywood
Feather-Edge Foam Wing Cores
Full Size Rolled Plans
Standard or Micro Compatible

The kits come with high quality feather-edge wing cores, light balsa plywood, and spruce, complete full size plans, and hardware. The suggested retail price is $55.00 per kit and ready-to-cover planes are available. Call Charlie Richardson at C.R. Aircraft at (619) 630-8775 for ordering information. ■

The Pre-Built Sparrow

...from NorthEast Sailplane Products

This new Sparrow comes with fully sheeted Obechi covered wings which are reinforced with carbon fiber at the high point of the cord and at the trailing edge allowing the Sparrow to carry up to 16 oz. of ballast. We have pre-routed the aileron/flaperons so only the task of facing is left to the builder. To further increase durability and strength, the leading edge material as well as the aileron facing is basswood. As with all NSP kits, the Sparrow pre-built is of the highest quality throughout containing pre-cut tails, and wing tips as well as the full complement of hardware, a full sized set of plans, and detailed instructions.

The airfoil used on this Sparrow is the SD8000 giving an extended speed range over the kit version that uses the SD7080 airfoil. Using three servos, with two in the wing, gives the Sparrow more precise, crisp aileron control, the ability to use the ailerons as flaperons or spoilerons and leaves room under the wing saddle for ballast.

We chose the SD8000 airfoil to give the pilot a higher top end, yet with the use of camber control, still has the low speed and thermaling ability that has made the Sparrow such a well-liked sailplane. To best utilize the performance of this more advanced Sparrow, we recommend the use of two servos in the wings. Any good micro servo will do nicely and with two wing servos and a programmable radio, the Sparrow can use camber changing to slow the plane down for thermaling and/or light lift. The surfaces can also be used as flaperons or spoilerons that can shorten the landing approach giving the pilot an opportunity to fly slopes with less than ideal landing areas. An interesting mix particularly useful for Vision radio owners, is to couple the flaperons to the elevator giving a little down camber when you pull up elevator. In slow flight, this allows the Sparrow to turn slower and flatter, in fast flight a tighter turn will result. Vision owners can easily activate or engage this feature with the use of the gear switch.

The Sparrow in any configuration is a very clean sailplane and although normally the wing loading is fairly low, allowing the Sparrow to fly in light lift conditions, adding ballast to this beautiful little slope cruiser will make it go fast! In good conditions and full ballast, the Sparrow will give the larger full out racing machines a run for the money!

Specifications

Pre-Built Sparrow

Wingspan	66"
Area	395 sq. in.
Weight	24 oz.
Wing Loading	9 oz./sq. ft.
Airfoil	SD 8000
Radio	270 maH Battery, Micro/Mini Servos, Regular Size Receiver
Skill Level	Int/Int
Price	$169.95

Sparrow Racer 60"

Wingspan	60"
Area	350 sq. in.
Weight	28 oz.
Wing Loading	10 oz./sq. ft.
Airfoil	RG15
Radio	270 or 600 maH Battery, Micro Servos, Standard Receiver
Price	$189.95

Sparrow Racer 60"

For the more advanced folks who really want to go fast or fly in stronger conditions, NSP is offering the Sparrow Racer 60". This Sparrow comes with composite pre-painted wings and tails as well as a Kevlar reinforced fuselage. The wings have been shortened to 60" and the tail has been reduced in volume to maximize the efficiency of this very fast version. Don't expect this version to fly in the very light lift the original Sparrow is so well known for. The Racer was designed for speed and turning ability.

We chose the RG15 airfoil to give the Sparrow Racer the best combination of speed and efficiency. The wings and tail are vacuum bagged fiberglass over blue foam with carbon fiber reinforcement to withstand the forces resulting from high G turns. Two servos in the wing and a rigid trailing edge keep the Racer flutter free at high speeds.

The Sparrow Racer 60" comes as a complete kit like the rest of the Sparrow series. For best performance, we recommend metal geared micro servos in the wing and the use of an extended 600 maH battery pack. This pack is only a little larger than a 270 maH battery and is available through NSP. The Sparrow Racer is available only in limited quantities and orders will be filled on a first come first served basis.

Wings for the Sparrow pre-built or the sparrow Racer can be purchased separately.

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

The Sparrow

...by Yule B. Upgood (via Richard Moran)
Madison, Wisconsin

The Sparrow is a slope soaring enigma. To paraphrase Dave Thornburg [1] **...Thermal ships are designed to fly, slope soarers are designed to crash.** The Sparrow is a slope ship that is designed to fly.

The Sparrow has long, narrow wings, an arrow-like fuselage, and a tiny low drag vee tail. Because you sheet the wings, it costs less then those that come already pre-sheeted. The Sparrow is optimized for efficient slope flight, at the expense of aerobatic tricks, and rewards skilled piloting; it's not for beginners.

The Sparrow flies best in light to medium winds. It can almost survive on strong hill thermals alone, and can penetrate through 40 mph gusts without ballast. Having such a range allows slope soaring when everyone else is thermal flying on the flats. When the wind picks up... have more fun. The Sparrow flies best when flown fast. It requires faith to put the nose down and fly fast in light lift, but that is how to keep aloft. Not for beginners.

The SD7080 airfoil is enchanting. Selig, Donovan and Fraser claim that the lift range of the 7080 is much like the famous thermal S3021 airfoil, but with lower lift. They note the low drag obtained at low lift coefficients [2]. I cracked my copy of "Model Aircraft Aerodynamics" [3] and worked out the Reynolds number for the average wing chord (6") at different speeds. Because the wing is narrow, the Reynolds number gets quite low (which is bad) at low speed.

Re = 361.4 X V [miles/hr] X L [inches];
where V is the speed, and L is
the wing chord

Re	Airspeed
60,000	27.7 MPH <- the plane flies fine above 20 mph
100,000	46.1 MPH <- try to keep the Reynolds number high for better performance
150,000	69.1 MPH <- this is not a maintainable speed... but look at it move!

Next, I scrutinized "Airfoils at Low Speeds" [2] long and hard; the Sparrow flies great, and I wanted to know why. The SD7080 shows decent lift, with very low drag. At the speeds (Reynolds numbers) that you can practically achieve, the SD7080 looks very similar to the SD7037 - an airfoil that is becoming very popular. The low speed stall of the SD7080 is very gentle. I never would have bothered to look up all this collaborating data if I hadn't believed for myself in the first place. The SD7080 makes a very nice wing.

This stuff is all very interesting (Well, maybe it is.), but what about the kit? The kit is complete, providing the minimum. The instructions consist of a full-size blueprint. That's it. The Sparrow was straight forward to build, taking only 30 hours to complete.

The fuselage is fiberglass, sleek, and quite light. There are a lot of pinholes to fill, indicating a "no excess resin" fiberglass lay-up. I had to add about 2 oz. of lead to the nose to balance the plane. I would prefer a little more fiberglass (at the expense of some lead) in the "kissing end" of the fuselage, to accommodate a style of landing that I sometimes adopt.

The wing is blue foam sheeted with 1/16" balsa, and has balsa leading edges and aileron stock trailing edges. Because the wing chord is thin, making the wing skins is easy; you butt two balsa sheets together per wing sheet. Balsa leading edges can't take a hit from a tree branch or car antenna - the balsa leading edge disintegrates, the wing sheets peel back and splinter, and the core is crushed. I fly

Darryl Lonowski (President of the Madison Area Radio Control Society) left, and "Buster" Upgood tosses the Sparrow. The site is "Cedar Hills" in Black Earth, Wisconsin.

at a nasty slope, so I dry-bagged a 1" wide piece of 1/2 oz. fiberglass around the wing's balsa leading edge. The glass and resin add good strength, and keep the balsa sheeting from peeling and splintering in the event of hitting a small, unyielding object. I tested the reinforced structure by flying out of sight and headlong into a cedar tree. Very minor damage after clonking a branch.

0.75" of dihedral (root to wingtip) in the wing provides very stable flight characteristics. There isn't any spar or graphite tape under the wing skins, the wings flex slightly when loaded, but I haven't broken them by flying. In the interest of science, I have tried.

The aileron servo is embedded in the center of the wing. It was challenging to get sufficient aileron throw and differential because of the narrow fuselage. Plan ahead. Putting two aileron servos outboard in the wing would be a snap, and free up room for bigger batteries (which would be great) and ballast. With a computer radio, you would have one very hot small ship. That is how I would do it, if I had it to do over again.

The vee tail has small, teeny tiny, "you've got to be joking" control surfaces. When the decalage is adjusted and the center of gravity is tuned in, the tail has enough moment to pull the Sparrow through power loops and inverted flight. Its no joke; the elevator works fine. Getting the angle of the tail with respect to the wing (decalage) is essential (and hard to measure), as is getting the tail on straight, while keeping the vee level. First, I tacked the tail on lightly, using jigs, eyeballing, and sighting from the front and rear. I'm glad I tacked it on lightly. It was crooked the first time.

Specifications

Type:	Slope soaring; 2 channel - V elevator with ailerons
Wingspan:	65"
Length:	36"
Wing loading:	9.25 oz/ft² (as tested)
Aspect ratio:	11:1
Root chord:	7"
Tip chord:	5"
Wing area:	375 in²
Weight:	23 oz. with Futaba 4NBL micro radio receiver, 250 mAh battery, 2 S133 servos
Airfoil:	SD7080 (thickness: 9.15%, camber: 2.48%)
Made by:	Culpepper Models
Avail. from:	Northeast Sailplanes, (802) 658-9482
Price:	$99.95

The wing is very narrow, so small changes of location for the center of gravity strongly affect the elevator trim and overall flight performance. The CG marked on the plans (2.25" from the leading edge) is far too nose heavy. I worked my CG back to 2 15/16" - it is now much more responsive and efficient, yet still self-recovers from the Dive Test. Plan ahead for adjusting nose ballast in small increments, as it makes a big difference.

In general, if you fly the Sparrow slowly, it sinks. In light slope lift, fly long, straight, fast passages with smooth,

efficient turns. Small adjustments in the elevator trim tab result in throttle like changes in speed. Trim the Sparrow's nose down with several clicks of elevator trim, bump the nose down with the stick, and wait. The Sparrow is light, it takes a few seconds (and a loss of altitude) to gather speed. Once cruising speed is obtained, the Sparrow starts moving (quickly) left to right, nose slightly down, and gains back lost altitude and more. The next trick is to wait through a long straight pass, then turn efficiently. If the turn isn't done just right, with plenty of down elevator to finish the turn, the Sparrow will balloon to great height, losing most of her speed. This is not tragic; initiate another shallow dive and try, try again on the other edge of the slope. Until flying the efficient Sparrow, I was unaware of how subtle and difficult a really good turn is. Fortunately, this plane can be flown very often, and practice makes perfect.

I was surprised to find out just how little wind it takes to keep this sweet plane aloft. The secret is to let her run in long, straight, efficient lines, and take advantage of any thermals that you fly through. Don't dally in sink - punch up wind and find a thermal (or crap out). Obviously, this technique requires experience with the plane, and at least a medium sized slope site.

Landings are very tense. Notice the Sparrow's speed flying near the ground. (!) The wonderful efficiency of the plane is the landing liability, and the Sparrow is too sweet and fragile to just dump in to the hill. The Sparrow has a low speed mode, which isn't easy to maintain. Clicking some up elevator trim helps. I often have trouble losing altitude and slowing up to land. The 250 mA battery is stone cold unsafe after 1 hour 45 minutes. I found that a long, corkscrew spin is sometimes the only way to bring the Sparrow down when the slope lift and thermals are really working. Practice spins by holding the control stick towards a back corner. Practice before your battery is low.

The Sparrow flies like a dream because of its airfoil, clean lines, and moderate weight. It would be nice if it was more crash resistant, and had more room inside. These complaints are trivial. For the intermediate or advanced slope pilot interested in a light to medium wind speed machine, consider the Culpepper Sparrow. I really like mine.

Dry Bagging

...by Yule B. Upgood

Dry-bagging is a way to get a very smooth finish on fiberglass work without too much sanding. When I dry-bagged the leading edge of my wings, I masked behind where I wanted the fiberglass to end with masking tape. Laminate the leading edge with epoxy laminating resin and glass cloth as usual. Then, put a piece of clear plastic (Saran-Wrap or Monokote backing plastic) over the wet glass. Carefully stretch the plastic taut, and tape so. Working from the leading edge of the wing, carefully smooth the plastic down, working the excess resin and air bubbles towards the trailing edge with a credit card. The next day, pull off the plastic and masking tape - the fiberglass is smooth, with no weave pattern to be seen! Only minor sanding is needed at the edges.

References

(1) "The Old Buzzard's Soaring Book", Dave Thornburg, Pony XPress, 5 Monticello Drive, Albuquerque, NM 87123

(2) "Airfoils at Low Speeds", Selig, Donovan and Fraser, Soartech 8, available for $20 from Herk Stokely, 1504 N. Horseshoe Circle, Virginia Beach, VA 23451

(3) "Model Aircraft Aerodynamics", 2nd edition, Martin Simons, Argus Books

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Butter-Bee: A Lesson in Futility

...by Al Sugar
Lewisville, Texas

The Butter-Bee was an inspiration generated by the fact that the Monarch Butterfly is the soaring champion of our planet. Simply stated it completes the longest goal and return, non stop, of any flying creature. The second fact that I wanted to prove was that unilateral wing spars made of balsa employed full depth similar to Larry Conover's concepts are strong enough to handle normal rigors of launching and soaring. And the third fact was that for years I have heard that we are building our sailplanes wrong, and that if we concentrate on two meter, we should go for the larger Reynolds number via more wing chord.

Well one out of three is good, isn't it? The wing did break once, however, the plywood carrythrough at a dihedral joint failed during a zoom launch in a 20 mph breeze. The wing and the balsa spar is still intact and flying after the new carrythrough was installed. I am convinced that the nylon reinforced balsa spar was the success story of this project; too bad the flying part was so shabby.

At first the 5 oz per foot, low aspect ratio, 2 mtr. machine seemed to be what I was looking for. The 8% thick airfoil slid through the air well for so light a sailplane. In fact, I had trouble keeping it on the field. After some impressive comparison flights, I decided to "combat" the mighty Hawk and learned that I had a big problem. Straight line flight in lift was effective and speed was sufficient to keep up when following the bird into a lift area, however when the bird started its spiral upon reaching the core it went up rapidly, whereas I faded down because my sink in turn (spiral) was ridiculous. Since then I tried all kinds of experiments with dihedral, loading, rudder throw, and CG.... all to no avail. This machine duplicated a low aspect ratio machine that I built years ago who's failure I blamed on the misapplication of a thick airfoil.

The above results lead me to look closer at the three current machines I'm flying. All are 6 square feet of flying surface, all have the same overall fuselage length, all have similar loading (6.5 oz per ft), and all have the same rib height. The high aspect ratio in the family is 15 to 1, middle 11 to 1, and the Butter-Bee 6.5 to 1. Airspeed for the three is similar and in straight flight, sink is about as expected. Sink in turn is the demon that really separates the geometry. When I put my 15 to 1 aspect ratio in a spiral the sink increases by approximately 25%, and when I chase Hawks it out climbs them 2 to 1. My 11 to 1 aspect ratio has a sink increase of 50% when spiraled, and it won a reputation of being a 1 1/2 Hawker. Now comes Dumbo, 6.5 to 1 aspect ratio Butter Bee, and just like the original tripping over its ears, the sink in turn appears to increase by 200%. I guess that is why the Monarchs take such wide wobbly turns in their spirals when working lift. It's humiliating to discover that man cannot easily unravel the mysteries that evolution spent millions of years hiding. In any case, it appears that sink in turn is effected by aspect ratio, and for a sailplane to have good thermal characteristics that aspect ratio should be greater than 13 to 1.

Let's dump the butterflies and go for the real thing, the Black Albatross. Now we have the F3B version of the soaring birds. At 16.7 lbs. our average Albatross has a 43 ounce per square foot wing loading, 118 inch span, 7.875 chord, aspect ratio of 15 to 1, and 930 square inches of area. Although close to some of the dimensions of the equipment observed at the flying field, the intense loading figure indicates that the mean camber line of the airfoil (MCL) is not 2%, but must exceed 5% for these masters of the air to enjoy a L/D of 23 to 1, at an airspeed of 35 mph. Yes, our F3B machines eat the Albatross in performance because of the weight difference which allows a lower MCL, plus the advantage of a smoother finish that is more efficient; however, this knowledge gives us insight as to the limits of loading we modelers can handle in the ocean of air. Personally, I believe the ingredients for stay-up-man-ship is more oriented to the design of the Albatross rather than the F3B machine for the following reasons:

1. With the pilot earthbound and immobile, an airspeed of 35 mph is just about right for the average day, and will make sure the model stays within a 1000 foot radius, i.e., the typical soaring field. Sailplanes here in Texas just seem to have the rhythm to work lift efficiently and move from thermal to thermal easily at that speed. Before I am attacked on this statement, let me identify the fact that a floater's airspeed is more like 18 mph, and a typical F3B better than 45 mph (without flap).

2. Weight increases inertia so dynamic soaring states are higher because velocity regulation is much better. This translates into more up and down reactions as the model responds to the air, rather than insidious speed changes that surprise grounded pilots.

3. The 15 to 1 aspect ratio indicates high efficiency and low sink in turn. Add the rough feather finish on the upper surface, and washout becomes uncritical. (Note: This is great for a bird, but you won't catch me building anything like that.)

On the downside, however, is the fact that thin, high aspect ratio undercambered wings simply will not high-start, nor land safely without some kind of suspension. Since I like the middle ground the birds have taught me, I feel as though I am in the Twilight Zone... Hey, Dave Thornburg, you are not alone.! Dave is one of the masters that translates this area of soaring (material, ingenuity, science, and dynamics) into a realistic package that will (thermal) you up... to cloud base, if you will listen to him. I simply believe the "threads" will be a little coarser if you were to use a little more aspect ratio.

Well, now that my interest in the Butter-Bee has died and has been replaced with sailplanes above an aspect ratio of 13 to 1, if anybody ever asks me about "Low Aspect Ratio Sailplanes", I'll simply tell 'em not to "BUG" me!! ■ P.S.: After doing the above article, I rebuilt a model of the Gentle Lady that I had flown for years, competing successfully against Prodigy's and Prophet's. The new Gentle Lady has an aspect ratio of 12 to 1, compared to the original 9 to 1 aspect ratio. Now that I, and other pilots, have been flying both Ladies there is no doubt to the higher aspect ratio's superiority... airspeed is noticeably higher, spiral diameter smaller without obnoxious sink, and dead air time of both machines within a "heartbeat". Before anyone gets excited about Goldberg's kits let me explain that my versions of these machines are heavily hybridized, i.e., fiberglass laminated fuselage, upper surface sheeted tip to tip, and glass reinforced. Empty flying weight 27 ounces, typical weight 32 ounces. Wait a minute! Since both machines are carrying 4 ounces of extra ballast, let's move the trailing edge of the high aspect ratio Lady a little closer to its leading edge, and try for 14 to 1 aspect ratio without ballast... ■

The Anabat VI (Or, Combat Returns)

...from Jef Raskin
Pacifica, California

A number of Vultures, RCMAers, and other fliers have now built Anabat VIs. With the help of Neil Davis, Mark Watanabe, Ralph Voorhees, Jim Calonico, Aza Raskin, Peter Calonico, and Yesseo Tekerian, a whole bunch of wings and fuselage blanks were made in Jef Raskin's workshop. These parts are being given away to Vulture members, and even though the program is only a couple of weeks old, many of these planes showed up at the fun fly on the 26th of April, 1992. In spite of the winds being light, going fitfully from 3 to 8 mph and back again, many good flights were put in.

The Anabat VI is a small, responsive, very inexpensive, very easy-to-build, multi-purpose slope soarer. Building time is from two to four hours! The airfoil is Raskin's fully symmetrical WE3008, and it gives the plane a very wide speed range and gentle stall. Windspeeds at which the Anabat has flown, measured at six feet above the edge of the cliff with a Davis digital anemometer, have ranged from 4.5 mph to 28.7 mph. Of course, if it can fly upright, it can fly inverted since not only is the wing symmetrical, but there is no decalage — wing and stab are aligned. This makes it not only one of the very few sailplanes with a fully symmetrical airfoil, but the only one we have seen that allows you to practice inverted flight and other aerobatics in very light lift.

With limited control throws and the ailerons drooped about 1/16th inch, it seems to be a very good slope trainer. A few beginners have found it easier to fly than "traditional" polyhedral floaters since its response is so much quicker, yet built a tad nose-heavy with a bit of up-elevator trimmed in it is hands-off stable. With moderate control throws it is a fine intermediate ship. 8-year old Aza can launch and land it, has some command of loops and rolls, and reports that it is easy to fly. It is certainly easier to land than a floater. He has even achieved some controlled inverted flight — to his delight and his father's surprise. With extreme (30 degrees each way) throws, it is a riot for the experienced pilot, rolling almost too fast to follow, with enough penetration to do a full vertical roll upwards.

Radio equipment has varied from aileron-and-elevator to a full aerobatic computer-controlled four-servo set-up. The four servo Anabat has rudder, elevator, and flaperons; the flaperons are programmed to move down with up elevator and up with down elevator so that in upright flight there is positive camber to the wing and in inverted flight there is negative camber. In addition, the flaps are independently adjustable and are coupled to the elevator (down flap gives down elevator and vice versa so that there is minimal trim change with flap application). Of course, the flaperons move in opposite directions as ailerons when the stick is pushed sideways. With its full-size receiver, four micro servos, and 600 maH battery pack, this maximal Anabat weighs 15 oz (most are in the 11 to 12 oz range), yet the flaperons give it tighter loops than other Anabats and it climbs like a hawk.

Even without all this fanciness, a simple rudder control installed as a third channel makes the Anabat a natural for learning precision slope aerobatics; the rudder makes hammerheads and point rolls relatively easy. One of the design's few drawbacks is that it is not good at snap rolls, an avalanche is quite difficult. Its light weight and foam-and-tape construction means that crashes are rarely fatal, most requiring either no repair or a quick fix with a piece of tape. With the spruce spars, there is plenty of excess strength in the wing design. Two Anabats have been loaded to 20 oz and flown successfully including extended vertical dives with abrupt pull-up without the wing bending (as far as the eye can tell). It can't be broken in the air without a collision.

With its light weight, relatively slow flying speeds, and foam construction (especially the foam fuselage and foam wing leading edge), it is quite safe for close-in aerobatics or combat since a collision with the pilot or spectators is unlikely to injure them or the plane. Combat? Since Raskin's Western Wind kits stopped being available, our annual combat contest has not been held due to lack of a cheap easily-built and indestructible model. The Anabat allows us to bring back this favorite of spectators and pilots, alike.

Combat Rules - The Plane

- A more or less standard Anabat VI, using the provided 36" span wing blank tips, can add no more than 1" to the span
- The overall length should not be under 30" nor over 33" (the stock design is 32" long).
- Plain balsa stabilizer and elevator 10" to 13" span, 4" to 5" max. chord. Any shape, OK.
- Fixed fin, no rudder, 4" to 5" max. chord, 3" to 5" max. height. Any shape, OK.
- No reinforcement of the leading edge of the wing, just foam and tape, please. With either of the specified tapes (fiberglass strapping tape of Scotch Mailing Tape) it is quite strong enough.
- No sharp edges, cutting, or grappling devices allowed.
- Two channel, two servos only, aileron and elevator control.
- Weight under 13 oz. (no lead sleds, please). This weight will accommodate a 250 maH battery pack, two mini-servos (micros not required, but are OK), and a standard receiver. All two-channel Anabats have been under this weight limit so far, so it should not be a problem.

The Game

1. The object is to knock everybody else out of the air as many times as possible. Everybody starts with zero points.

2. Rounds are for a fixed, agreed-upon time (e.g., six minutes). The round begins thirty seconds after the last plane is launched. The contest director can call out "thirty seconds to battle" when the last plane is in the air. When the round starts, the C.D. can say "Ladies and Gentlemen, We have a battle"... or some such. At the end, the C.D. says, "You have thirty seconds to land." And when the thirty seconds are over, the C.D. says, "Time's up."

3. One point is added to the score of both pilots when their planes touch and the pilot or pilots retain control. After a touch, the pilot must prove control by doing a roll (the "victory roll") to prove that he or she is in command.

4. Two points are subtracted from the score of a pilot each time his or her plane touches the ground or any non-flying object before the end of the round. Relaunch is allowed during the round.

5. Three points are added to the score of a pilot who causes another plane to go down as the result of a touch (a "kill"). A victory roll is required for the points to be awarded.

6. One point is added to the score of a pilot who is flying at the end of the round and who lands within thirty seconds of the end of the round.

7. The winner of a round is the person with the highest score that is at least two points.

Rationale

Rule 3 allows both pilots whose planes touch to get points since it is usually impossible to judge who caused the touch. The victory roll not only proves that the pilot is still in control, but prevents two collaborators from just flying in formation, touching gently over and over. Formation flying is still a good strategy, but with the roll you have to reformate for each point.

Rule 4 penalizes fliers who lose orientation or control in the heat of the battle. Yes, you can have a negative score. The re-launch rule encourages much hilarious scrambling after downed planes.

Rule 5 gives a big bonus to the aggressive, skillful, or lucky pilot who downs an opponent while remaining aloft. It is good to have a few judges watching so that they can assign credit properly.

Rule 6 helps get everybody down quickly so that the next round can start.

Rule 7 prevents a "sandbagger" from winning.

Example: Snoopy VS Red Baron

A minute and a half into the round, Snoopy's plane touches the Red Baron, and he does a victory roll: 1 point. Snoopy then gets a kill on the Red Baron and does a victory roll: he gets 1 point for the touch and 3 points for the kill. Total is now 5. going after the Red Baron, who was flying low to trick Snoopy into crashing, Snoopy misses his target, hits the ground and loses two points. Total is now 3. He re-launches and the end of the round is called. Snoopy lands in the thirty second interval for 1 point, and so leaves the round with 4. Meanwhile, the Red Baron got 1 point for the first touch since he did a victory roll, too. In the kill, the Baron did not get one point for the touch (no victory roll) and lost 2 points for the landing or crash. The Baron got no points for Snoopy's crash since the planes didn't touch. At the end of the round, the Red Baron lands in the thirty second period and ends up with a total of 0 points.

Maneuvers for the S.F. Vultures' 26 July 1992 Sanctioned Precision Slope Aerobatics Contest

I also thought you might be interested to see what kinds of maneuvers were flown in 1992 and how they were scored.

There were two categories: two servo and unlimited. If a plane is equipped with more than two servos, it must fly in the unlimited class no matter how the servos are used. Pilots call "start" and "finish" to each maneuver.

The judge scores each maneuver as follows (only whole number scores allowed):

0 Unrecognizable or incomplete
1 Recognizable and completed, but with many faults
2 Only a few faults
3 One or two minor faults
4 Perfect, or nearly so

In the following descriptions, a few common faults are called out as an aid to understanding the maneuver and guiding process. The listed faults are not exhaustive.

Two Servo Class

1. Barrel Roll

The plane rolls while smoothly gaining and losing altitude. Downgrades: roll is too axial, loss of heading, excessive change of altitude from entry to exit, roll is uneven or cusped.

2. Half Cuban 8

A 5/8 loop with a half roll on the 45 degree downward slant with recovery to level flight at the starting altitude. Downgrades: heading doesn't reverse during maneuver, loop not round, loss of line during roll, roll started before roll complete, not exiting at entry altitude.

3. Two Point Roll

Roll from upright to inverted, hold inverted for a moment, roll in the same direction to upright flight. Downgrades: rolls not same speed, roll not axial, loss of heading, inverted point not held, plane bobbles, loss or gain of altitude.

4. Outside Loop Upwards

From inverted, loop upwards. Downgrades: loop not round, inverted entry not established, exit not at same altitude as entry, loss of heading.

5. Double Split-S

Roll inverted, recover with a half loop downward, as soon as level flight is achieved, roll inverted again, recover with another half loop downward. Downgrades: loss of heading, two half loops not the same size, loop started before roll completed, second roll started before level flight is achieved after first half loop.

6. 360 Degree Inverted Turn

From level inverted flight make a 360 degree turn while remaining inverted. Downgrades: circle not round, excessive gain or loss of altitude, excessive change of attitude.

Unlimited Class

1. Right wag, left wag, half roll, inverted right wag, inverted left wag.

The plane shall be flown away from the judges, while keeping the wings level, the nose of the plane shall be yawed to the right, centered, and then to the left. The plane will be half-rolled to the inverted position and the nose of the plane shall be yawed to the right, centered, and then to the left. Right and left are as seen by the judges. Downgrades: wrong number or direction of wags, loss of heading or altitude, not keeping the wings level, not spending equal time at each wag.

2. Outside, inside vertical 8 starting upwards from inverted flight

The plane shall be flown level and inverted perpendicular to the judges line of sight, make an outside loop upwards, and then an inside loop downwards, exiting inverted. Downgrades: non-level entry or exit, loss of heading, non-round loops, loops of unequal radii.

3. Two turn spin

The plane shall be flown straight and level, and stalled into a spin. No points will be awarded for a spiral dive. Downgrades: not stalled at entry, wrong number of turns in a spin, loss of heading.

4. Vertical rolls up and down with inverted exit

The plane will pull up from level flight, execute a full roll, push over to vertical downward flight, execute a full roll and return to level inverted flight. Downgrades: not establishing and keeping true vertical lines and horizontal lines, not completing the rolls, loss of heading (the plane should exit in the direction opposite to that in which it started. It is not required that entry and exit be at the same altitude.

5. Two deceptive turns

Going upright left to right past the judges, the plane shall complete 3/8ths of a roll to the right and make an outside 180 degree turn, fly inverted from right to left, make a 3/8ths roll to the left and an inside 180 degree turn, exiting upright to the right. Downgrades: not establishing lines or making rolls or turns of the wrong amount or direction, excessive altitude change.

6. Four point roll from inverted to inverted

This shall be flown going away from the judges. Downgrades: loss of heading, excessive change of altitude, the four points not being of equal duration and timing. ■

The "Fourth Annual Precision Slope Aerobatics Contest" was held in 1992 in Pacifica, California. The background on this event and the "1993 Sailplane Precision Aerobatic Sequence" are in the November, 1992 issue of *RCSD* on pages 48-49. A review of the Anabat is found in the January, 1993 issue of RCSD on page 32. Jef Raskin's address is Eight Gypsy Hill Road, Pacifica, California 94044; (415) 359-8588, FAX (415) 359-9767. ■

NASSA News Flash

Attention North American Scale Soaring Society members: here is the latest news about the happenings of the your new association. We North American Scale Soaring Society members are currently in the process of either preparing or doing several things for the membership.

First, we/you are, with the help of Greg Vasgerdian, generating a handsome **NASSA** membership card. The expected completion date of the design for the cards is January 25, 1993. We are hoping to get them mailed to members somewhere around the 15th day of February '93.

This new membership card will include such items as the member's ID number, when they joined NASSA, their address, their AMA number, and their club affiliations other than NASSA. Greg is designing the card such that it will have a generic logo which will remain the same from year to year. However, his card design is such that a scale glider/sailplane/PSS image will be changed from year to year. Thus, the card will have some aesthetic value. Just think, you might be able to start a NASSA card collection, HEY? Also, we will hopefully have the cards laminated for durability. So, if you have a scale glider design that you think would look nice on the card send it to NASSA and Greg will evaluate it for use on the 1993 card.

Next, NASSA is preparing a set of club by-laws. The purpose of the by-laws will be, of course, to provide a guideline for NASSA members and officers. These by-laws are intended to make the best possible association for the benefit of its membership. Just as importantly, the association by-laws are being created to give all members an equal opportunity to participate in the association's evolution and growth. As such, they will provide a format for the equitable handling of all club moneys and funds. The intent is to create an association treasury that is managed and allocated to provide **NASSA** members an opportunity to fly scale soaring models of any kind, any where; don't you agree? Please, members, if you have recommendations that, you believe, will benefit **NASSA** send them to NASSA, 3540 Eastlake Dr., W. Richland, WA 99352. Then, your recommendations will be evaluated via the membership and they may be incorporated into our guidelines. Let us emphasize that this is a organization for the enhancement of scale soaring in North America. We will attempt to avoid at all cost the promotion of individual egos.

Therefore, **NASSA's** current membership believes we are presently in the process of creating a format for FUN. What this rather high brow statement means is: we members are attempting to create a format for scale R/C soaring such that it is as much fun as any other part of R/C soaring. And, we are trying to create a format that will afford interested flyers with a challenge to their flying and building skills. We want to offer members a chance to both enter and host NASSA events utilizing a simple format (similar to the one adopted by the Australian scale soaring association) that promotes rather laid back events geared towards FUN scale. We, however, recognize that fun means different things to different people. So, we are attempting to generate a number of formats within **NASSA** that will hopefully not only attract members to scale R/C soaring as a fun diversion from other types of R/C, but will also entice them to participate in **NASSA** events or tasks. The result being that R/C scale soaring will grow as any facet of the hobby.

Because fun does mean so many different things to so many different people we feel we need input from all members of **NASSA**. However, before you pick up a pencil and start writing (INFO. on a MAC disk or an ASCII file in 3.5" format will be both helpful and a time saver.), here are some of the ideas we have come up with. Look them over and then please help us build a new association.

Flying Tasks

1. **Duration** tasks for different scale sizes (i.e., 1/5, 1/4, 1/3, or even 1/2 scale) is certainly one that task members may feel worthy of pursuing. The reason for possibly breaking this task out by size is because different size models require different levels of skill, and because different size models have different flying characteristics.

This task could also be broken up into categories of either thermal or slope flights. It would be somewhat similar to the LSF tasks; however, the task would parallel the full scale soaring format for badges. As an example, a pilot would have a task of say 15 minutes, 30 minutes, 1 hour, 2 hours, or possibly 8 hours. **NASSA** could possibly even recognize records established. Or, the North American Scale Soaring Association could petition the AMA to establish a separate class for scale R/C soaring records that members could challenge.

2. **Distance** tasks could also be established for different scale sizes. This class would most likely be broken into Vintage and Modern classes. The advantage of breaking the tasks out by both Vintage and size would be that tasks would then be much more recognizable for the class. So, Vintage models being flown such as the Fafnir, Reiher, or the ASK-18 would be recognized for the achievements separate from modern. Also, different size scale models would denote different levels of skills. This is only assumed because, as an example, a 1/2 scale glider will be able to both fly higher and faster. This is not to say that a 1/5 scale model cannot be flown as high or as fast as a 1/2 scale model. The assumption here is that a 1/2 scale model would be easier to see at great altitude than the 1/5 scale model. As well, the 1/2 scale glider will fly faster because it will weigh more. And, because it is flying faster it may very well benefit from a greater Reynolds number yielding a somewhat better efficiency. Again, if you have ideas, let's hear from you so we can possibly implement those ideas.

3. **Speed** may also be a task worthy of pursuing. This task could be challenged by all classes of scale from Vintage to PSS. Speed tasks could be challenged on the slope, thermal field, or in a cross country format. The challenge would certainly result in very specialized models, but the fun part would be confronting those tasks with scale models. Within this format scale models would certainly be emulating full scale soaring. The possibilities are wide open with options such as cross country goal and return tasks that challenge the flyer to complete the course as fast as possible. The speed task may be as simple as PSS ships being timed as they zoom from base A to base B.

4. **Racing** would certainly fit within the framework of the NASSA organization. It could be broken out by both size of model and Vintage. We have already had interest by a group of PSS fliers wanting to organize a format for racing PSS models on the slope, similar to F3F and AMA 454 type events. This could be extremely fun for pilots and spectators. Additionally, the challenge of a competition where Vintage scale ships race around a cross country course seems no less exciting, while super ships such as 1/3 scale all glass Modern scale replicas could be simply stunning in how they might perform on a cross country race circuit.

5. Thermal soaring rallies such as the **1993 NASSA R/C SCALE RALLY** is probably going to be the main stay of the association. They will ideally be organized by members around North America for the sole purpose of bringing together scale R/C soaring advocates. **NASSA** will place special emphasis in this area. We currently envision these rallies as thermal non-contests with a task very much similar to the tasks adopted by our Australian scale soaring partners.

The Australians, according to Martin Simons, have adopted a very loose format which divides the models into two classes. The Vintage class being a model patterned after a soaring aircraft built before November of 1957. The 1957 date is a mark in time

when the first all fiberglass sailplane was built and flown. Any model patterned after that date is considered to be a modern ship. The break point is simple and clean and therefore should be quite easy to determine for event organizers.

Also, the Australians have a very simple task. The task is to obtain a specified amount of air time (i.e., 40 minutes). This air-time may be obtained on one or on multiple flights; the choice is left to the pilot. The idea behind the format is very fundamental; it allows scale soaring enthusiasts to both display their model and to fly them. The goal is, of course, to stay aloft for the pre-determined amount of time.

Also, the task includes a landing. This is not the typical spot landing, but rather a landing that emphasizes control of the aircraft. Therefore, the landing task is to land the model on some type of runway. The pilot is penalized only if the model does not come to rest within the boundaries of the runway. As a result, the task does not result in hard or structurally abusive landings.

Lastly, the launches are via a tug or a winch. So, with tugging the scale realism of launch becomes even more a part of the event. And, with winches towing Vintage models up such as the SG-38, or Grunau Baby, the launch realism is very much a part that class, also.

So, what do you think? If you like the concept let's hear from you. If you don't, let's hear what you would change. But, remember, this is not about egos; this is about fun and scale.

Lastly, remember Tom Kikuchi of J.R. Radios has offered an X-347 radio to be raffled off to one of the lucky members who's name will be drawn on May 15, 1993. ■

Schedule of Special Events

Date	Event	Location	Contact
Feb. 6-7	Southwest Winter Soaring Contest	Gilbert, AZ (602) 831-1905 or 839-1733	Iain Glithero
May 28-31	Mid Columbia Cup Slope Races	Richland, WA	Roy Lightle (509) 525-7066
June 26-27	NASF/MASS Mid-South Soaring Champs	Huntsville, AL	Ron Swinehart (205) 883-7831
July 10-11	North American Scale Soaring Assoc. Rally	Richland, WA	Wil Byers (509) 627-5224
July 16-27	AMA NATS	Vincennes, IN	
Sept. 18-19	TNT Texas National Tournament	Dallas, TX	Henry Bostick (214) 279-8337

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Results of the World Postal 2M Soaring Contest

...by Morten Munkeso
(Chairman of Sealand's Model Soaring Club [S.M.S.K.], Denmark)

(In the July, 1992 issue of *RCSD*, there was a World Postal Soaring Announcement from Morten Munkeso. The results of that invitation are included here. For those of you who were interested in participating, but for some reason were unable to because of weather or timing, Morten's address is included in the previous issue should you wish to contact him regarding future events. ED.)

The 27th of September the weather was a bit nasty in Denmark when we started up the competition on "Stensletten (our airfield). We waited for about one and a half hours in order to get into the air. Even though it was very foggy in the beginning, we started and succeeded with good thermal conditions and light wind. As you can see in the picture, it was quite a success with many participants from S.M.S.K. and neighbor clubs. The autumn in Denmark normally doesn't attract that many glider pilots, but the truth is that we had put the contest together with another event in order to get reasonable response from Denmark.

We had five crashes during the day, which were mainly caused by the high voltage wires going through our airfield, which sometimes causes trouble. However, it seems like quite a few crashes occur when more than 10 gliders are in the air at the same time. The problem is that when you really get the lift, you know that it probably won't last as long as you want it to. Therefore, you go a little high and then you forget to look at your own glider. Very often, it happened that we had 12 gliders in the sky, but 13 or 14 pilots were controlling them. We got quite a laugh afterwards when we tried to find the pieces from the other planes, which hadn't been controlled for some time.

As you can see from the scores, we have been practicing a little, but don't be scared of the score level. Due to the very gentle wind, we had excellent landing conditions; it's not normal for so many pilots to have scores over 4000 points.

Next time, we are going to have a similar contest, and we will ask the pilots to write on the schedules what type of aeroplane they used. Some pilots have indicated soarer-types, and it gives an impression of what soarer is the best, overall. To me, it seems like the "Spirit" from Great Planes is the best standard aeroplane on the market for the time being, as it combines both high and low speed with nice, excellent flying characteristics. ■

Name/Model	Country	Score
Lars Henrik Sorensen Riser	Danmark	4397
Poul Moller	Danmark	4241
Knud Hebsgaard	Danmark	4238
Gunnar Bryde	Danmark	4190
Borge Martensen Blue Phoenix	Danmark	4088
Borge Hansen	Danmark	4072
Klaus Untrieser	Danmark	4063
Stig Christensen	Danmark	4059
Keld Orum Jensen	Danmark	4050
Jens Frederiksen	Danmark	4039
Keld Hansen	Danmark	3951
Morten Munkeso	Danmark	3934
Rene Madsen	Danmark	3930
Bo Bojsen	Danmark	3892
Vern Poehls	Arizona, U.S.A.	3870
Ole Blomseth Spirit	Danmark	3769
Bill Roseberry	Arizona, U.S.A.	3766
Robert Anderson Scratch-built V-tail	California, U.S.A.	3752
Jan Albert De Witt Selvkonstruktion	Danmark	3743
Jens Peter Jensen	Danmark	3728
Lars Andersen	Danmark	3702
Alan Schwerin	Louisiana, U.S.A.	3670
Erik Nienstadt	Danmark	3664
Jan Abel Cliff Hawk	Danmark	3637
David Griffin Sophisticated Lady	New Zealand	3617
Craig Trout	Arizona, U.S.A.	3612
Jan Ronkel	Danmark	3583
Mathew Dimock Goldberg Electra	New Zealand	3567
Tonny Christiansen	Danmark	3509
Tom Killough	Alabama, U.S.A.	3498
Jorgen Meier	Danmark	3495
Dave Wenzlick	Arizona, U.S.A.	3486
Jorgen Tonnesen	Danmark	3485
Jorgen Jespersen	Danmark	3460
Morgens Poulsen	Danmark	3436
Finn Nielsen Blue Phoenix	Danmark	3424
Erik G. Sorensen Sagitta 600	Danmark	3394
Ejvin D. Larsen	Danmark	3379
Jens larsen	Danmark	3336
Thomas Pedersen Blue Phoenix M.V. Hal	Danmark	3309
George Hoffer	Arizona, U.S.A.	3279
Rex B. Powell	Alabama, U.S.A.	3255
Ole Thorup	Danmark	3243
Stefan Pamnell	Sverige	3198
Heine Larsen	Danmark	3188
Justin Ammon	Arizona, U.S.A.	3179
Tim Rowland	Arizona, U.S.A.	3078
Sven-Erik Hallin	Sverige	3033
Martin Moller	Danmark	2981
Vagn Sorensen	Danmark	2961
Bertil Winblad	Sverige	2863
Bjorn Jorvad	Danmark	2807
Harry Hougard	Danmark	2783
Roger Hort Wanderer	California, U.S.A.	2764
Chris Pennell/Spirit	New Zealand	2728
Marc Law	Danmark	2720
Thomas Tate	Arizona, U.S.A.	2656
Rob Condliffe/Spirit	New Zealand	2638
Warren Trethewey Spirit	New Zealand	2599
Per Skouboe Jensen	Danmark	2595
Svend Erik Lauersen	Danmark	2566
Jan Asplund	Sverige	2562
John Olsen	Danmark	2556
Hap Merrifield Wanderer	California, U.S.A.	2545
John Archibald Oly 650	California, U.S.A.	2461
Per Moller	Danmark	2432
Ole Lund/Riser	Danmark	2318
John Ensoll Own Design	New Zealand	2310
Henrik H. Weise Nielsen - Spirit	Danmark	2248
Jorgen Stokbak Blue Phoenix	Danmark	2223
Joe Webb	Alabama, U.S.A.	2208
Bengt Caelen	Sverige	2100
Johni Evzen Beranek	Danmark	1917
Jens Hansen	Danmark	1912
Ian Harvey/Spirit	New Zealand	1894
Kelvin Lilley/Sagitta	New Zealand	1804
Lars Ericsson	Alabama, U.S.A.	1648
Bjarne Hansen Gentle Lady	Danmark	1561
Ove Svensson	Sverige	1525
Tom Weise Nielsen Gentle Lady	Danmark	1465
Alf Vallin	Sverige	1410
Olle Sandahl	Sverige	1294
Gunner Thegel	Sverige	1184
Bengt Gustafsson	Sverige	1042
Erik Ekberg	Sverige	958
Peter Stott Sophisticated Lady	New Zealand	865
Jonas Gustafsson	Sverige	412
Svante Caie	Sverige	149