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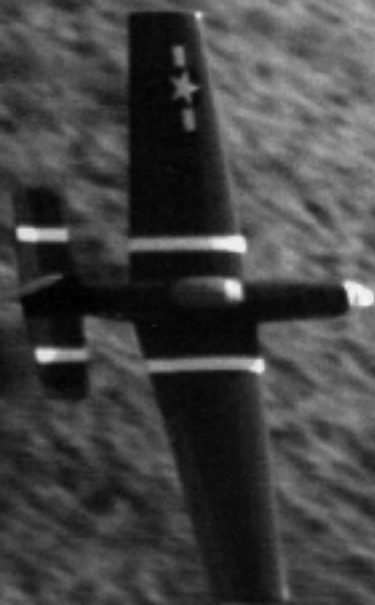
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Soaring
S I G E S T

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R/C SOARING DIGEST

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Wade Kloos' Foam-51 in flight. Photograph taken at Laguna Niguel, Slope Soaring Guild's club field, Southern California. Photo by Shelby Sanders, San Clemente, California.



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Somewhere in Texas...
We'll keep you posted!
...Judy

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The Soaring Site

For All the Little Things...

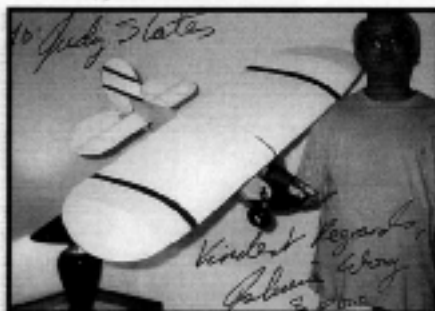
We wanted to take a moment to say thanks for all the little things that a number of you have done this past month! Thanks for the supportive words included in your e-mail messages, letters, and phone calls. Thanks also go to Dave Sanders, who channeled some spare energy our way, so that we could get the printing schedule back in line. (If we figure out how to bottle this stuff, we'll let you know... Because it really seems to work!)

Special thanks also go to each of the columnists and to those of you that have put pen to paper, or fingers to keyboard, and sent in articles about subjects you wish to share, several of which are included in this issue.

It seems like only yesterday that we started doing RCSD. And, looking back, over the years, we recall many of you having said that RCSD keeps getting better and better. And, we asked ourselves, "just why is that?" Well, frankly, it's because of the little things that each of you do! Thanks a lot!!!

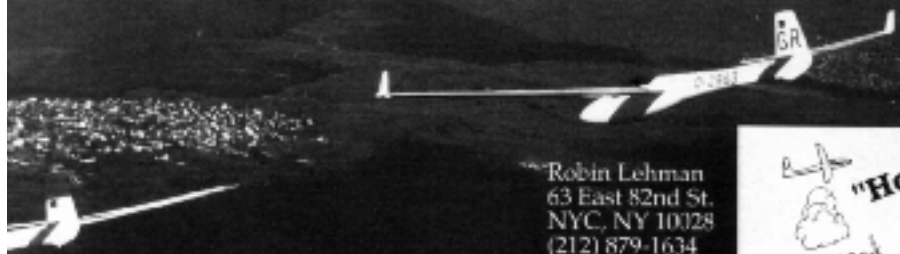
Little Things Say a Lot!

This neat photograph of a Lazy Bee was autographed, and returned with a subscription renewal, by Johnnie Wong, a subscriber in Singapore. Thanks, Johnnie!



And, to all of you, happy flying!!
Judy & Jerry Slates

Winglets Revisited



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A really beautiful shot of the Libelle in flight. The winglets bring this beautiful vintage sailplane up to date. It is a lovely German landscape, isn't it? Peter Selinger photo.



I read, with interest, in a recent issue of Soaring magazine, that winglets are being fitted on the standard Libelle. According to the manufacturer, Peter Seliger (in Germany), winglets were added to, "...Improve aileron response, particularly at low speeds. ...The pilot feels as if he has control over a completely different sailplane..." These winglets work at both low and high speeds! So, now it would seem that all sailplanes might benefit from winglets.

R/C Winglets

I recently received a letter from Norm Roushar, Chatsworth, California, stating that his Discus flies great. It, "...Flies in light lift, it's easy to handle and land."

Norm enclosed some pictures, and the really extraordinary part of all of this is that he built winglets onto the airplane... Pointing downward! Norm says, "The idea for the downturned tips came from watching crop dusters make those slow speed turns." He goes on to say, "...Slow

Art Boysen believes in winglets on his ASW 27. Robin Lehman photo.



Art Boysen's beautiful Nimbus. Photos from Art Boysen.



Left winglet on 1/1 ASW 24. Note the turbulator tape, aft!! Robin Lehman photo.



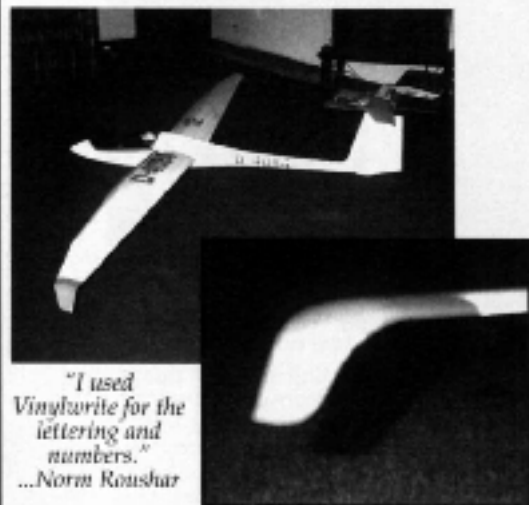
Norm Roushar at Jones Hill in Thousand Oaks, California. "The idea for the downturned tips came from watching crop dusters make those slow speed turns. They all seem to use the same tips." ...Norm Roushar.



A nice shot of the Libelle on tow. Winglets really give this ship much better aileron control, especially during slow flight! Peter Selinger photo.



September 1996



"I used Vinylwrite for the lettering and numbers." ...Norm Roushar

"Vulnerable? Not so! I used inverted tips on my 4 meter DG-300. Only 2 cracks in 2 years, they were easy to repair. Grain of wood is vertical." ...Norm.



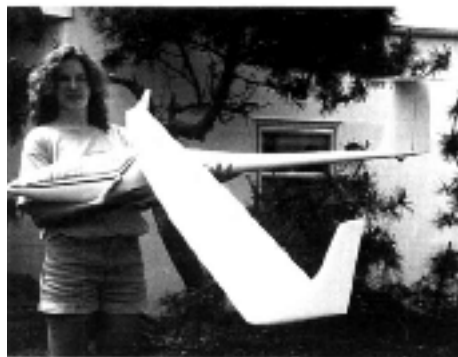
Robin in love with the 1/1 ASW 24, which landed during the Fayetteville airtow fly-in 1996. Everyone was delighted to see such a beautiful bird! Asher Carmichael photo.

Winglets on the wings...
Winglets on the tail...
Winglets on the fuselage...
What next???

(Left) Close up of Libelle winglet. Peter Selinger photo.



Page 5



Winglet on the EMS 1/4 DG-800.
Robin Lehman photo.



you want to try winglets on your bird, try them pointing both up and down and see which is better. Who knows, you might teach the big boys a thing or two!"

I guess we have a lot to learn!

Art Boysen's Nimbus 4

Art Boysen, Silverdale, Washington, sent in some really nice photographs of his Nimbus 4. His ASW 27 has winglets, too!

Good flying! ■



ZIKA

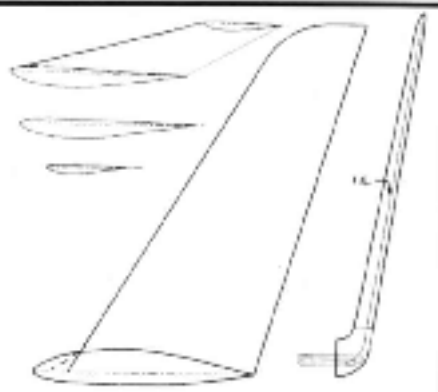
R/C Soaring Digest

to a crawl and it will not stall."

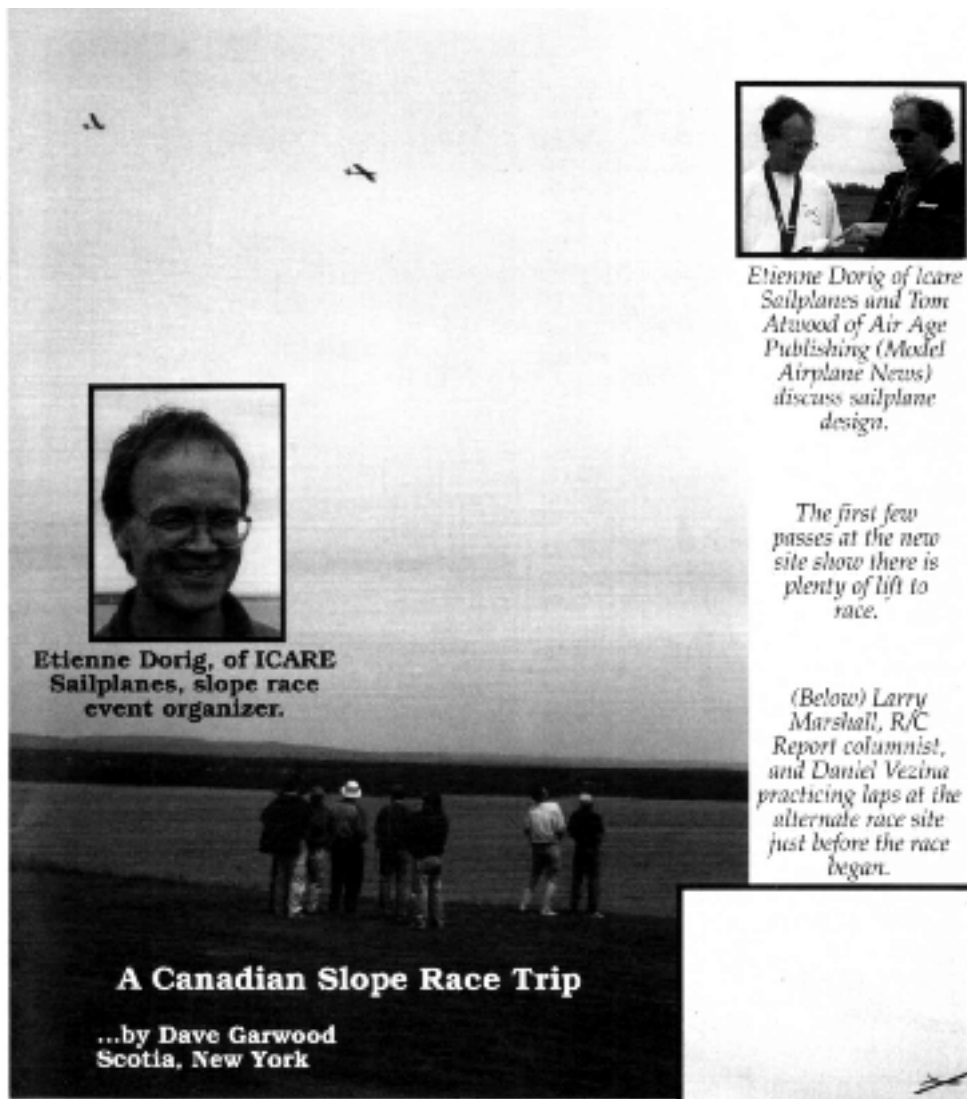
What I find interesting about all this is that we are always learning! You may have noticed that, when you get into most jets these days, the new winglets are installed at ninety degrees to the wing and point up. All full-sized sailplane winglets, that I have seen, point upwards, but some S.T.A.L. aircraft have wingtips curved downwards. (The Huskey is an example.) Most motor glider wings are in this category. The last 737 I rode on had a flat piece of metal (with no airfoil that I could see) stuck on the wingtip, pointing up and down. Apparently, in this case, not even the big boys could make up their minds, and so they went both ways!

According to Norm, his downward-pointing winglets work very well on his Discus. For all I know, it will work very well on other airplanes, as well.

I guess the moral of this story is, "If



AN EXAMPLE OF A WINGLET USED ON ONE OF THE MORE MODERN, FULL-SIZE SAILPLANES.



Etienne Dorig, of ICARE Sailplanes, slope race event organizer.



Etienne Dorig of Icare Sailplanes and Tom Atwood of Air Age Publishing (Model Airplane News) discuss sailplane design.

The first few passes at the new site show there is plenty of lift to race.

(Below) Larry Marshall, R/C Report columnist, and Daniel Vézina practicing laps at the alternate race site just before the race began.

A Canadian Slope Race Trip

...by Dave Garwood
Scotia, New York

June 7 dawned still, gray and overcast; not a good sign for the hopeful event scheduled for the following day: slope races on the St. Lawrence River in Quebec.

As Tom Atwood and I headed up the Adirondack Northway, we drove in and out of light rain and spoke little of the weather. Generally, a passing cold front is a good sign for slope soarers, bringing wind and dry, cool air in the high pressure air mass behind the front, but the weather forecasters were calling this one "a slow moving front", and we silently wondered how long it would take for the skies to clear.

The weather was looking so grim there was little point in talking about it, or in expressing our private thoughts of whether we should be making the trip



north, or instead should be driving somewhere else where the weather was more likely to be flyable.

Neither of us expressed any doubt aloud, as we were committed to attending the event. If it weren't for a band of French Canadian soaring enthusiasts in *Province de Quebec* (PQ), then all scheduled, North American slope racing would be either on the west coast or in Kansas. We had to support them, as a matter of East Coast pride, and so we headed north as planned.

There is excitement in an international trip. Some people like to go over the mountain just to see what's on the other side anyway, but there's a little extra enthusiasm associated with crossing a national border, and anticipating time spent in a little bit different culture.

Tom and I both commented that this was one of the important aspects of this trip. And a road trip, any road trip, provides a change of pace and a change of scenery. To borrow an expression from the fishermen, "A bad day at soaring is better than a good day at work." So we drove north. In the rain.

Race Day

Saturday morning, the rain was gone and the wind was blowing. After a quick breakfast, we headed for the slope race site on Route 132, just west of Leclercville, on the south bank of the *Fleuve St. Laurent*. We were joined by 15 sailplane pilots from Quebec and Montreal, renewed some old friendships, and made some new ones. Wide smiles broke out all around. Soon, discussion turned to the wind and the obvious fact that, while the wind speed was sufficient for flying, the wind direction was ninety degrees off from the direction we needed.

While two backup sites had been announced, neither was flyable in the present northeast wind direction. Daniel Mc Rae and Etienne Dorig took off to reconnoiter the river bank for possible flying sites for this wind direction. Three miles up the road, their car top carrier suddenly flew open and spilled sailplane wings, struts and fuselages across the highway.



Friendly forest workers help retrieve a plane from a tree landing.

Interestingly, it was at this point in the weekend that our luck started to change.

The car top carrier accident happened right at a northeast-facing point, about 80 feet above the river. Not only that, the grass was mowed on top of the hill. In addition, the owner of the land witnessed the bizarre incident, and helped Daniel and Etienne pick up the sailplane parts. Seems that the landowner had an interest in model aviation, and when he learned of the search for a suitable hill for today's race, he invited us to fly from his land. So, we set up the turn markers and



Two sailplanes on the race course. Andre LaRoche (caller) Alex Wenzel (pilot), Etienne Dorig (caller).



Daniel Mc Rae, Michael Hayworth, and Etienne Dorig assemble turn markers.

began to practice flying. There was plenty of lift for light and medium weight sailplanes to run the course, and to perform aerobatics. Things were looking up.

Some of us didn't notice how close the trees were to the course until we put our airplanes into them on landing approach. Construction workers in the forest helped by lifting pilots into the trees to get their planes with the front end loaders on their tractors. The landowner brought out an extension ladder to recover other planes. All stranded planes were recovered in short order.

The race director, Etienne Dorig, called a pilot's meeting and announced we would fly two classes: polyhedral planes and alleron planes. He went over a few rules and we began flying immediately. Pilots when were not flying, took turns calling or flagging for those who were racing.

Not many forms of model aviation provide the heart pounding excitement

and adrenaline pumping rush of racing. Then, after three heats, the wind died. Oh boy. All that adrenaline flowing, and now what to do? Some flyers pulled out hand launchers, but we didn't find much lift in the small field by the river.

Always Bring an HLG

The wind dwindled to a breath, maybe 1-2 mph, and it changed direction. A scout group returned from the original Leclercville site, and announced it was flyable for very light planes.

We thanked the landlord, packed up, and headed over to the original site where, for almost all intents and purposes, the wind was calm. Not a single blade of grass was moving, but the almost imperceptible breeze was moving into the face of the hill. "Too light to sustain flight," most of us thought.

Somebody assembled a hand launcher and threw it over the edge, hopefully, tentatively, and it stayed up for one, two, and three passes. Others launched their HLG's, and soon there were eight planes in the air: Chuperosas, Mosquitos, an Obsession, a Comdogger, and a Climmax.

For the next hour and a half, we flew in the lightest lift imaginable on this magic hill by the St. Lawrence River. It was a remarkable day.

Bad News, Good News

Here's a review of the things that went wrong, and right, on the trip. Compare and contrast with a day at your local flying field:

1. Although the wind was not right for flying at our primary site, we quickly found another suitable site, set up the gear and began the race.
2. We got our planes stuck in trees, but friendly strangers brought ladders and tractors with front end buckets to help us recover the planes. Their immediate, friendly, and helpful response was remarkable.
3. Wind became too light to race, but we flew hand launch gliders in amazingly light lift on an amazingly efficient hill.
4. Our crystal controlled, weather radios work in Quebec, but the

broadcast is in French, giving us a chance to recall what we could from high school French class.

5. Even though some of us from Connecticut and New York don't speak much French, the Quebec flyers spoke enough English to allow us to communicate with no real problems. A ready smile gets you pretty far in any language.

6. The reception we received from the PQ pilots and others was exceptional. Whatever fear or hesitation you may have about visiting a foreign country, be aware that as flyers we were received as visiting dignitaries. The language differences in PQ were but a tiny problem, and the warmth and friendliness given to us by these folks made for a great experience.

We didn't get to race for two solid days as we had hoped. In many ways, the trip turned out to be more memorable

than if things had gone according to plan. It was a day filled with tough luck and countervailing good luck, a day that presented problems that were quickly overcome with ingenuity and enthusiasm, and a day of international friendship and camaraderie.

Future PQ Slope Races

Etienne Dorig reports that he's had enough positive feedback from those who attended this preliminary PQ slope race to proceed with scheduling a three day slope racing event in May 1997. For more information contact Etienne at Icare Sailplanes (381 Joseph-Huet, Boucherville, Quebec Canada J4B 2C4; voice (514) 449-9094, FAX (514) 449-3497, or via e-mail: <ICARE@telts.com>). You may also find information related to the site and the race on Louis Cimon's R/C soaring Web page at: <<http://www.mediom.qc.ca/~lcimon/planeur.htm>>. ■

Soar Tows with Bigfoot Not Sasquatch Podiatry, Aero-towing!

Conversations with the Winch Doctor

...by Douglass Boyd
Estacada, Oregon

The full size guys do it all the time. Those Europeans do it, too! Even a few innovative folk here in the US do it. I'm talking about aero-towing, here.

The Winch doctor and I tried it about 15 years ago with a brand new, state-of-the-art, Bird of Time, and a Schnurle, .60 powered, Sweet Stik. We started out with three strikes against us:

- #1. The line was attached to the tail wheel of the tow plane. This is acceptable for full size, but not the best method for models.
- #2. The tow plane was set up to go fast, not pull strong and steady.
- #3. Attachment to the glider was the captive release on the underside near the center of gravity. (Big mistake!)

In spite of these disadvantages, we still managed to get 8 or 10 successful tows (successful meaning not crashing). We did, however, have trouble with the

different forces at work in our operation. As we began to climb out, the Bird of Time, with the belly mounted towhook, wanted to kite up the way it would on a winch. This raised the tail of the tug and caused it to dive, and as it increased in speed, the more the sailplane pulled the tail wheel up. More than once, we found ourselves with the tug pointed straight down, full throttle, and the sailplane in level flight with the wings flexing a LOT!! We quit while we were ahead and still friends; we saved both aircraft from destruction. We figured it was worth a try later when we had the right equipment.

One rainy Saturday night, the Winch Doc and I began to discuss aero-towing, again. It seems that there is a renewed interest in aero-towing. A few people, scattered over the US are showing the rest of us that it can be done. They have built large scale sailplanes with enough room inside to install extra servo actuated release. They also have built special, easy to fly, tow planes with lots of pull at slower speeds.

"Change comes slowly," The old Winch Doc mused, "I believe there are three basic reasons for resistance to this change."

- #1. "In order to do an aero-tow, the sailplane must have some kind of

servo actuated release doohickey in the nose. This represents a commitment of time and effort (\$) and extra weight in order to do aero-tows. This eliminates the spur of the moment whim to try it."

- #2. "Where are you going to DO the aero-towing, Grasshopper? At the power field? At the glider field?"

I answered back, "Everybody knows that gliders and power planes can't peacefully co-exist." Then, I asked, "What about the third reason?" The Winch Doc narrowed his eyes and said, "Reason #3 is fear of the unknown..."

The Answer

The Winch Doc stepped up to his chalkboard, which was scrawled with equations; real rocket scientist stuff, you know. He erased all that stuff and muttered, "Dam it, Jim, I'm a Winch Doctor, not a rocket scientist." Then he cleared his voice and began his lecture. "Let us address these three reasons in reverse order."

Armed with a large piece of chalk, he began to scratch furiously on the board, making scritch and screeching noises loud enough to make the dog run and hide. "First, #3: fear of the unknown... To heck with fear of the unknown! We're pioneers, remember? Boldly go where no one has gone before... etc." Nuff said. For #2: where do you do aero-towing? Why not do aero-towing at both locations. Set up a day at the glider field for aero-towing and do it there if your field rules permit noisemakers. Or, find a power field; chances are a club-member knows of, or is a member, of a power club. He's probably the guy that has the tow-plane, anyway."

Then, I asked him about the release doohickey. "How many sailplanes have you seen with a specialized R/C actuated release installed in it?" The truth is, nobody has a Thermal Eagle with a built-in release. There is no room. Only specialized scale sailplanes would have a release built in. More people have thermal duration ships than scale ships.

Just then, a bolt of lightning flashed through the roof and struck the old WD smack on the noggin! "Why hasn't someone else thought of this before?"

He said, "I MAKE THE TOW PLANE RELEASE THE GLIDER!" He jumped up and down, and ran to the chalk board, trailing wisps of smoke from his hair.

"Here's how it works. The towplane is a specialized airplane anyway, right? So, we put a special release in it. There is enough room for anything we want to put in. This release is actually two separate releases that attach to a loop in each end of the towline. The glider has a ring stuck into its nose, not unlike that nephew of yours, only this one is just a screw-eye. The towline goes from one release back to the sailplane, passes through the eye and forward to the second release on the tug. We aero-tow as usual, until the desired altitude is reached; then the towplane releases one end of the line. The towplane accelerates away from the glider, and the towline slips easily through the screw-eye. The sailplane is now free. The tug can land and repeat this cycle as long as fuel (ugh) holds out. The towplane can then make a low pass over the field and drop the line by operating the other release. The only specialized equipment required on the sailplane is the screw-eye!"

"OK, great idea! But will it work?" I asked, "What if the ring in the nose snags on something, like what happened to my nephew? I mean, what if the line snags in the screw-eye on the way through?"

The next day, we got up on my barn and I tested this at least 100 times practicing releasing a weighted screw-eye with no snags at all. For added assurance, I silver-soldered the joint in the eye and filed it smooth. I made up several of these in advance before we went out to the local gas power field. We towed up Ian Brightbill's Lovesong, and a Harley Machaelis' Joster using this method, with smiles on all pilots afterwards. The tug was my Bigfoot, a Quadra 35 powered 1/4 sorta-scale cub. The two tow releases were attached to the fuselage near the trailing edge of the wing for convenience. I am now convinced that ANY sailplane, from Ninja to Nimbus, can be aero-towed using this method.

Now that the problems have been solved, what's stopping you? Reason #3? ■



Trey Finney launching the Bullet. Fred Mallett photo.



Radio tray set up. Finney photo.

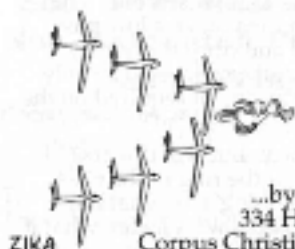
Trey with Bullets flown at Mid-South Soaring Championships. Fred Mallett photo.



attached to a very short, strong high start. (In the case of the launcher that comes with the Bullet, there is 20 feet of doubled up, 3/8" highstart, with 12 feet of line to the tow hook.) Then, the buddy leans into the rubber and starts shuffling back until standing at a 45 degree angle, while trying to hold onto a yard's span worth of airplane without having any fingers cut off by the flight surfaces upon release. With a nod of your head, and consciously keeping your fingers off of the stick, the plane is released with a whoosh, and starts off at a fantastic speed. Now is the time to decide. Do you smoothly pull up and go for altitude to play with? (Which is usually to about winch launch height.) Or, do you trade a little altitude for some vertical rolls? Or, do you have real guts? This means taking all that speed and turning it into low level, wild aerobatics. One of my favorites is to slow roll inverted, while still cruising low; then, push into a huge outside loop, and burn off the rest of the speed with some low level loops and rolls. This is definitely slope flying on the field. Occasionally, you can rest your brain by looking for lift, and pretending to be a thermal plane, but I figure that if the flight lasts over 30 seconds, you were not yanking the stick around enough. These planes are as much fun to watch and launch as they are to pilot.

The kit comes with the ailerons routed out, and an unpainted fuselage. The

This Old Plane



ZIKA

...by Fred Mallett
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Slope on a Rope The Bullet Bird from Finney's Hobbies

I wish I could take credit for the title, but I can't. In fact, I don't even remember who I heard call this type of flying "slope on rope"; all I remember is getting a big chuckle out of it. Slope flying is a ball, especially with a small, fast plane, in big lift, doing wild aerobatics, on a small slope. Using a ballistic launching device, and the Bullet, it is possible to get the same adrenalin rush flying on a flat field. Many of you have heard of this type of flying, often called catapult launching, and now there is a plane available that was designed specifically for it.

Picture the typical flight profile. A buddy grabs the tow ring, which is

Bullet Specs.	
Kit: \$199 (Introductory price includes Launcher.)	
Wings pre-sheeted/routed, ready to join, tails pre-beveled, elevator pushrod pre-made, Ziggy aileron horns, pre-built radio tray, stainless steel tow hook.	
Pre-built: \$255	
Ready for radio, mono-coated tails, painted/finished wing. Radio installed if sent to shop, or bought with kit. Will even test fly, and provide Vision programming sheet.	
General	
Weight:	11.5 oz. w/110ma, 3 HS-60 servos
Type:	Catapult Launch
Wing	
White foam core, obechi sheeting, carbon diamonds top and bottom, TE glass reinforced.	
Span:	38"
Area:	231 sq. in.
Wing Loading:	7 to 7.5 oz./sq. ft.
Root Chord:	7"
Tip Chord:	4"
Panel Break Chord:	6.25"
Break:	11.5" from root
Dihedral:	Builders choice, recommendations included
Airfoil:	RG-15
Tail	
V-tail:	110degrees
V-tail Area:	29.5 sq. in.
Fuselage	
Fiberglass w/kevlar tow reinforcing	
Length:	28"
Controls	
Flapperon/Elevator	
Designer: Trey Finney	

fuse is worth note, as the work is beautiful. There were no pin holes on my fuselage, and it feels like a baseball

it down, but that is not the purpose of the plane. In my opinion, this is a thrill machine!! ■

Composite Wing Construction Tips Part I

...by Lee Sayers
Cocolalla, Idaho

While composite wings are not new, the widespread interest in building such wings is a relatively recent phenomena. More composite kits are coming available today as both modelers and manufacturers recognize the aerodynamic and structural advantages offered by glass-bagged wings over their wood-skinned counterparts. Vacuum bagging equipment is more user-friendly, and lightweight composite materials have become increasingly available. All these facts have combined to attract more interest in the process of creating composite airplanes. To the first-timer,

the process may seem intimidating but is, in fact, well within the abilities of the average modeler willing to spend the time and effort to learn the techniques involved. As my friend, Harley Michaelis so aptly put it, "The process is not so much high tech as it is high mess!"

A number of very good articles have appeared in this publication covering the basic steps of composite wing construction. Instructions are also provided with currently available vacuum bagging systems to help you get started. It is not my intention to duplicate that material here, but rather, to provide some tips that will help the newcomer avoid the errors that can prove frustrating and sometimes costly in producing a good quality wing.

Some tips I will cover were lessons I learned the hard way and, while every

building effort has been a good learning experience, many mistakes were avoidable on later reflection. A special thanks to George Sparr of Aerospace Composite Products for his helpful suggestions along the way. The following tips are organized in the order typically encountered in building a wing from scratch. Not all aspects of the building process will be covered but focus will be put on tips which make the process easier, the wing more accurate, or offer an improvement in appearance.

Preparing the Core

When cutting relatively long panels (greater than 24 inches) with a Feathercut machine or manual cutting bow, it is a good idea to hesitate 5 to 10 seconds after turning on the power supply before beginning the cut. This will allow the center of the wire to heat up sufficiently to prevent wire sag caused by the ends nearest the power supply leads heating up sooner.

Use 3M77 spray or foam compatible thin CA to join wing panels rather than epoxy or other glues. Their use often results in a hard ridge near the surface of the core which will leave a corresponding bulge in the finished wing. This is due to the rest of the core compressing slightly under vacuum.

Preparing the Mylar Carriers

When waxing the mylars using a caruba wax allow the wax to dry thoroughly before buffing lightly. If using a parting wax, buff immediately after waxing, then allow the wax residue to dry completely. Wax and buff the mylars at least twice, then place in the sun for at least an hour to

ensure the wax hardens properly. This will go a long way toward preventing paint transfer problems when the mylars are removed from the finished wing.

In addition to Krylon paint, automotive paints also work well (I'm partial to metal flake blue.). If you are concerned about paint transfer, a uniform coloring of the wing can be obtained by using a light-weight fabric such as taffeta or acetate in lieu of paint. These fabrics come in many colors and are readily obtainable from your local fabric store. Use as a first inner layer rather than as the surface layer of the wing.

If you are painting the mylars, it is best to mist on several light coats initially to prevent fisheyes from forming. After this initial buildup, you can spray slightly heavier coats until the mylar is opaque. Allow to dry completely before laying up the wing.

Masking tape is usually recommended for joining the carriers at the trailing edge, however, it can be a real pain to remove after bagging. Instead, cut 2 inch wide strips from left over peel ply and spray with 3M77. Place the carriers on a flat surface with trailing edges 1/16" apart and put down small pieces of masking tape to maintain this separation. Take strips of peel ply and, starting at one end, press down and work along the length of the edge, removing masking tape pieces as you go. The peel ply hinge is much easier to remove after the wing comes out of the bag.

So much for the preliminaries. Next time, I will cover tips on preparing the vacuum bag and the bagging process itself, including how to ensure a straight trailing edge. ■

turning point in the history of warfare and military science. In those six years of war, Axis and Allied alike introduced countless new technologies, whose development had been accelerated by the urgency of war. Many of these technological advances occurred in the field of aviation. German scientists and engineers led the way with the early development of metal construction, aircraft cannon, jet- and rocket-powered aircraft, and advanced airframe design, unmatched anywhere else in the world. Although these technological advances are well-

known and important parts of the second World War aviation story, little is heard about another part, equally fascinating, but less futuristic in nature.

After the first World War, the Treaty of Versailles left the new German Republic no provision for rearmament, with specific clauses barring the development of new military aircraft types. (This restriction, ironically, was to plague the Allies twenty-five years later, as the German rocket program that would spawn the V1 and V2 was begun as a means of avoiding the restrictions, which gave no mention of rocket development.) Another type not specifically restricted by the treaty were gliders. Shortly after the partial stabilization of the country under the Weimar Republic, development of new glider types was begun by a new generation of German scientists, including Dr. Wilhelm Messerschmitt. As a student at the *Technische Universität* in Munich, Messerschmitt's S 8 glider design had broken the world duration record in September, 1921 with a flight of 21 minutes.

Eventually, however, as the restrictions of the Versailles Treaty were increasingly ignored by the German government, the development of gliders was shelved in lieu of powered aircraft. The glider's war fighting potential was never completely forgotten, however, and by war's outbreak, the development of a new type of assault glider was complete. The DFS 230 glider was of simple, high-wing design, with a wingspan of 72 feet, and exterior wing braces. Its slender cabin limited its capacity to 2800 lbs. of cargo (or ten fully equipped soldiers), however, for a normal weight of 4,700 lbs. It was used on the highly successful attack on Belgian fortifications in mid-1940. The launching system for this glider varied. Although it was possible to tow it to altitude and release it near the target, a more advanced method was also tested. Two high-thrust liquid fuel rockets were strapped under each wing root, and the glider was launched downhill on a shallow decline. The powerful rockets accelerated the light, clean glider quickly, and burned for under a minute, allowing it to reach a low gliding altitude. The DFS glider

had a relatively slender wing with a high aspect ratio, similar to the configuration of many kit gliders, today. The wing was tapered and cambered on both surfaces, and had no dihedral.

The glider's success in the assaults of 1940 led to the rapid development of another type, the Gotha 242, a larger model, weighing three times as much, capable of carrying 5300 lbs. of cargo, despite an only slightly larger wingspan of 79 feet. The thin, tapered wing was placed high at the rear of the box-like fuselage, supported by braces. The aspect ratio was significantly lower than that of the DFS glider, as the chord was increased to reduce the wing-loading on the six-ton aircraft. The tail consisted of thin twin booms and dual rudders, similar to the C-119 or Cessna 337. The ungainly design was cheap and shoddy in construction, mainly consisting of doped fabric stretched over wooden ribs.

Although the Gotha 242 did not see extensive action, the lasting impression of the potential for glider-borne assault prompted the German high command to request a design for a glider to be used in the expected invasion of Great Britain. The requirement emphasized the necessity for carrying heavy weapons, including tanks and artillery. A breakneck timetable was set for the development of this machine, and the order was handed over to the Messerschmitt company. Dr. Messerschmitt himself sketched the design, which was unlike any other ever seen. The cargo load, which had the requirement of over 10 tons, had to be contained in a fuselage capable of accepting bulky, awkward tanks and guns. The wing area required for such weights, especially at the low speeds at which it soon became clear the glider would have to travel, was enormous, and the placement of a concentrated mass such as a tank in the front of the fuselage would require the wing to be set very far forward on the aircraft, in stark contrast to the Gotha 242 model. To accommodate this, the tail boom would have to be shortened, to allow better pitching characteristics, a major problem given the large, forward-mounted wing.

The Me 321 Gigant

...by Yanni Tsipis
Chestnut Hill, Massachusetts

This article tracks the development of the German *Gigant* glider, the largest aircraft built during the World War II. Emphasis is placed on the technical aspects of the development, with a section following for any modellers interested in building a flying model of the aircraft.

The second World War was fought from 1939 until 1945, and marked a

A balance had to be created between the attitude stability of the aircraft, determined by the size and placement of the wing, and the potential for under-effective control surfaces, leading to dangerously sluggish flight characteristics, determined by the length of the tail boom. The balance was a delicate one, given the concentration of weight in the nose. If the wing were placed too far back, the aircraft would be unstable and nose heavy. The tail boom was shortened to enable the control surfaces to better affect the attitude of the thick forward wing. By the end of the design phase, the wingspan was fully twice the length of the aircraft, at 55 meters. The chord of the wing, at the wing root, was one-third of the overall length of 28.15 meters. The bulging front section had a flat floor that extended the length of the wing-root chord, then tapering off to the tail section. The control surfaces at the end of the truncated tail were large (nearly the size of the entire wing area of a Messerschmitt 109), and could be moved through better than a 30 degree arc either way. This feature made control more effective, but more difficult for the single pilot, who had unassisted, manual controls. The entire aircraft was covered with doped fabric, but had a solid floor to accommodate the heavy armor.

The lattice frame of the aircraft was made primarily of aluminum in order to provide the structural integrity necessary for such a large, heavy aircraft. Despite internal weight-saving measures, including drilled and tubular spars and components, the normal loaded weight of the aircraft was 35,000kg. The weight empty was 12,000kg. The aircraft was towed airborne by a variety of aircraft. The most underpowered of these generating 3,320 HP, the normal towing configuration producing 8,850 HP. In addition to these tow aircraft, as many as eight underwing liquid-fueled rockets could be fitted for enhanced takeoff and climb performance. These rockets burned for three - four minutes. The 300m² wing area enabled a takeoff speed of around 55 miles per hour to be obtained, and the glider with its towing aircraft climbed out at around

80 mph. This was a precarious situation for the powered towplanes, of course.

The flight characteristics of the glider were sluggish and stable, though the landing attitude was level, in contrast to convention. The aircraft could only be turned very slowly, as the slow speed combined with the high wingspan to create a precarious stalling tendency for the inside wingtips. The wings had a slight dihedral about 3/5 of the way out from the root, which alleviated this problem to some extent.

In service, the glider version was rarely used, until provision was made for it to be self-powered, using six surplus French engines. It was subsequently used as a transport on the Eastern and African fronts. Its cruising speed of 130 mph made it extremely vulnerable to air attack however, and its widespread use was quickly discontinued.

The Gigant was one of the great aeronautical experiments of the second World War. Although now it may seem ridiculous folly, at the time it was the largest unpowered flying machine ever built by man, and represented the extreme in the trend of military glider development. Today, it is an excellent base for study of aerodynamic design considerations for large, heavy aircraft.

A Note to Modellers

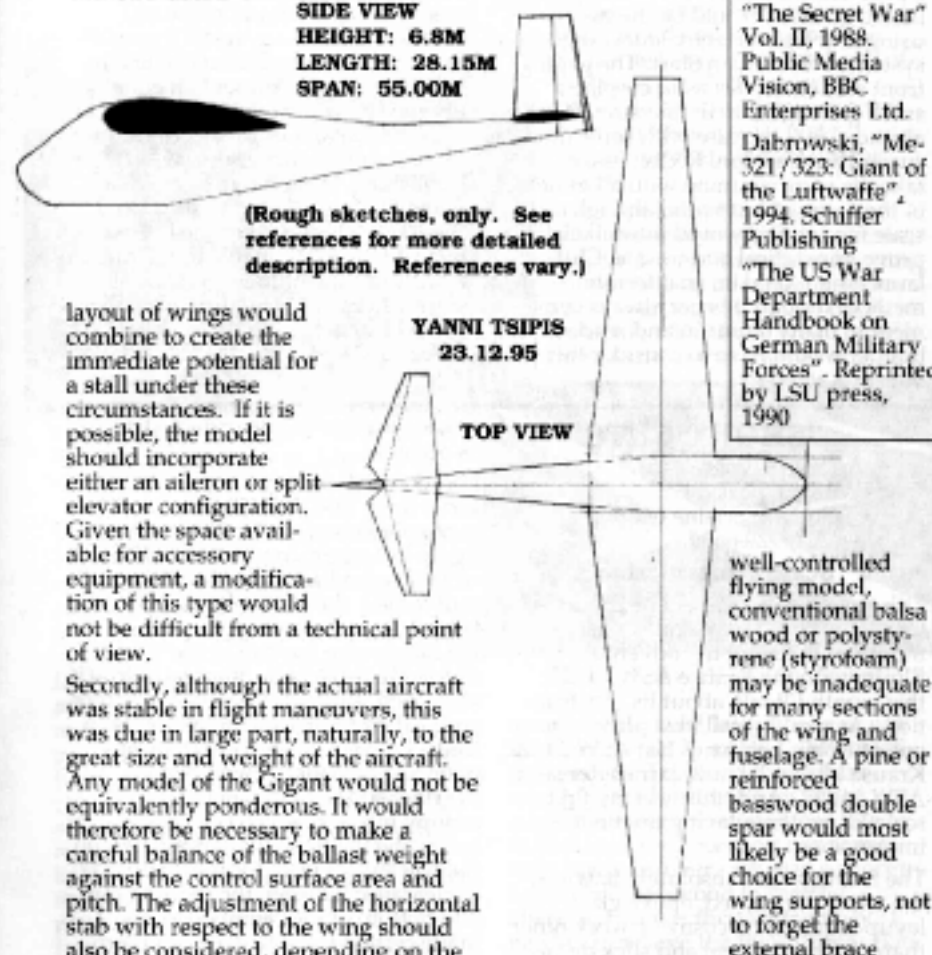
The Gigant glider would be an excellent design for a scale flight model. Because of its stable and slow flight characteristics, it would be an easy model to fly and control, provided the control surface areas and corresponding ballast weights are scaled and executed correctly. The large fuselage would accommodate the radio and servo equipment in the rear section aft of the wing, leaving the front section empty. This introduces the potential for mounting novel remotely-controlled equipment such as a small camera, often available for use in large model rockets.

Several considerations must be noted, however.

Firstly, the conventional practice of making slip-turns using only the rudder on many flight models would have to be approached with caution here, as the shape of the aircraft and

ME 321 GIGANT

SIDE VIEW
HEIGHT: 6.8M
LENGTH: 28.15M
SPAN: 55.00M



(Rough sketches, only. See references for more detailed description. References vary.)

YANNI TSIPIS
 23.12.95

TOP VIEW

layout of wings would combine to create the immediate potential for a stall under these circumstances. If it is possible, the model should incorporate either an aileron or split elevator configuration. Given the space available for accessory equipment, a modification of this type would not be difficult from a technical point of view.

Secondly, although the actual aircraft was stable in flight maneuvers, this was due in large part, naturally, to the great size and weight of the aircraft. Any model of the Gigant would not be equivalently ponderous. It would therefore be necessary to make a careful balance of the ballast weight against the control surface area and pitch. The adjustment of the horizontal stab with respect to the wing should also be considered, depending on the final weight of the flight model. A lightly loaded model may respond too severely, given the leverage of the tail surfaces on the wing, whereas one too heavily loaded would respond dangerously sluggishly, having a natural and distinct tendency to become nose-heavy. This tendency could be countered only by positive elevator action, which would be likely to induce a stall. The balances of control/ballast would be crucial to a successful flying model.

Thirdly, the materials appropriate for a model of the Gigant may differ somewhat from the conventional ones, when weight is at more of a premium. Given the high weight necessary for a

Sources:
 "The Secret War" Vol. II, 1988. Public Media Vision, BBC Enterprises Ltd.
 Dabrowski, "Me-321/323: Giant of the Luftwaffe", 1994. Schiffer Publishing
 "The US War Department Handbook on German Military Forces". Reprinted by LSU press, 1990

well-controlled flying model, conventional balsa wood or polystyrene (styrofoam) may be inadequate for many sections of the wing and fuselage. A pine or reinforced basswood double spar would most likely be a good choice for the wing supports, not to forget the external brace

leading from the base of the fuselage to the center of the underwing. The attachment points of the wing to the fuselage should incorporate a significant metal tube or I-beam. The stresses on this point would be higher than in most conventional gliders, given the size of the wing area and necessary robustness of wing construction. The builder should consider the use of thin soldered aluminum tubing for isolated sections of the fuselage to secure the wing-mounting brace to the rest of the structure.

Finally, the launching of the aircraft is a tricky problem. The frontal cross section of the aircraft is large enough to make stability and structural integrity

a problem should the initial acceleration be too great, as would be the case if using any high-velocity launching system such as High Start. The gaping front section invites us to employ a small gas engine to fly the aircraft to altitude, as is the case with some models currently in fashion. Rocket assisted takeoffs were common with all gliders of the German Luftwaffe, though on a scale model, this would most likely prove impractical and unsafe. Cliff-launching would be an effective method, though it is not always convenient to many of our inland readers. The builder would have to consider this question at length.

"SHORT CUTS"

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Scale Construction

This month's installment of "Short Cuts" continues with scale. Last month, I discussed my adventure in Elmira with the Krause ASW 24/27; this month I'll talk about its construction. As you'll recall, this plane was one of Robin Lehman's last ASW 24/27 Krause kits, as he now carries Roebert's ASW 24/27. And, this was my first scale kit, so I'm relaying my first impressions.

The fuselage was absolutely flawless; the white pigmented, epoxy glass layup required no cosmetic work other than placing the peel and stick decals, which were included in the kit. The fuselage weighed almost 2 pounds, but was structurally complete. This is over twice the weight of my Viking Models, U.S.A. Nimbus II fuselage, which is still on the drawing board. Jerry Slates' fuselages are quite light, and require bulkheads for structural integrity. So, this gives me two different design concepts to consider. The only thing I needed to do to the Krause fuselage was to glass tape the outer sheath of the elevator music wire along the inside of the fuselage. I also glassed-in an outer sheath for the antenna lead, as there was no need for it to tangle up in the pull-pull cable. Prior to that, the servo tray was positioned and marked

Despite the difficulties and uncertainties, the Gigant would make an excellent modelling study. It would make a unique specimen at conventions, and would present an equally unique flying experience. Further information and drawings of the aircraft can be obtained from Schiffer Publishing, in their two books "German Gliders in World War II," and "Me-321/323: Giant of the Luftwaffe" by Dabrowski, available in the military history section of most good bookstores. Additional inquiries can also be placed by contacting the author c/o R/C Soaring Digest. ■

to keep the music wire run as straight as possible.

I used 1/4" Luan plywood for the servo tray. The plans didn't show servo placement, so I took my time to figure out where to put them. The rudder servo had to be placed for pull-pull cables; the nose release servo was kept close to the side of the tray, so that the music wire leading to the release did not foul the battery access. Once it was fitted, slotted to receive the servos, and drilled to provide holes for servo leads, I gave it a couple of coats of poly, just for looks. However, I overlooked the placement of the canopy interior, which is recessed below the flange of the canopy face on the fuselage. Lucky for me, I had a 1/8" clearance between the receiver top and bottom of the canopy interior. I made certain that I had a lot of room for nose weight and the 1700 Mah receiver batteries. The servo tray was beveled where it fit up to the curvature of the fuselage, and secured with a thick mixture of epoxy and microballoons. A lot of masking tape was used to keep the mixture away from where I didn't want it. A popsicle stick gave the joint a nice, neat fillet. A smaller, vertical servo tray was placed in the upper portion of the fuselage to hold the single spoiler servo.

The wing fillet area in the fuselage is of sufficient strength so as not to require additional reinforcement. The recessed bosses that accept the wing rod tube required only the ends to be drilled



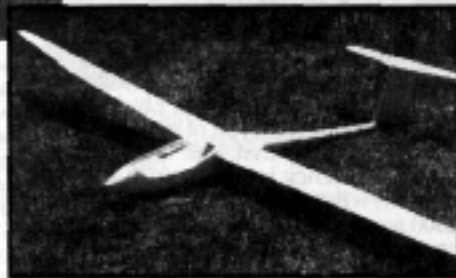
and filed out. The holes were right on the money; even the alignment pin recesses were exact; absolutely no guess work was required.

The next step was to work on the tail. The obechi skinned tailplane and rudder required minimal work; the elevator was already cut out, so I added capping, tips, and balsa leading edges. I melted out the foam at control horn areas, and filled them with a microballoon/epoxy mixture. The 5' music wire for the elevator tied into a pre-installed bellcrank and aluminum tube, which tied in directly to the elevator. I had heard rumors that the aluminum tube is prone to fracture on hard landings, so I drilled out some hollow carbon rod, and epoxied it over the aluminum. I got the rod and plastic coated kevlar pull-pull cable from Aerospace Composite Products. The kit came with steel pull-pull cables that I did not want to use; this is just my personal preference. The elevator was secured to the top of the fin with two #10 nylon screws. I expected to have to shim the top of the fin to get a perfect alignment with the wings, but there was no need. Once again, the fit was perfect.

The attachment of the rudder and control cables was the most difficult task in building the entire plane. This could have been due to my limited building and/or scale experience. I spent 3 hours trying to get the perfect fit and recess for the vertical fin stiffener. Trying to properly locate the connection points for the pull-pull

cable, over the hinge line for the rudder, was another nightmare. As it turned out, the connection point was too far back, and one of the cables got slack under full rudder deflection; this was not a major problem, rather just a disappointment. Next were the wings.

I elected to build the 24 version, because I was running out of time, and the 27 version required cutting out the flaps and installing servos. Robin said, that in the air, the flaps were no great advantage. The only thing to do to these wings was to



Steve Savoie & ASW 24 at Elmira.

install the tips and leading edges; cap the ailerons (all 33 inches), and install the spoilers. I decided to use basswood for the leading edges, since weight was not an issue (according to Robin), and my basement has some tight turns; hanger rash was a concern. I also used basswood to cap the ailerons, because they were flimsy. I needed to relieve the thick obechi skin at the flange area for the spoilers, so I nailed (#4 finish nails) a poplar guide to the top of the wing, parallel to the existing slot for the spoiler. A dremmel fitted to a router base was used to neatly cut the skins without any splintering. The nail holes were pre-drilled in the poplar; the nails were pushing into the guide and the wing without causing any deformation. This procedure was a little radical, but it worked well.

The spoilers were installed with a small amount of epoxy. I used heavy duty clevises, and I thoroughly tinned the cable that attached to the spoilers; this is one connection you never want to rework. The other end of the cable

was also tinned, but I used nylon clevises on the fuselage end. It is much easier to replace a nylon clevis at this end, than to dig out the spoiler to re-attach a clevis. That was it for the wings, other than installing servos and eye screws to retain the wings onto the fuselage.

I covered all flying surfaces with Oracover, white on both sides of all surfaces except the wings. I used full length red on the bottom surface of the wings. Airtotics hinge and gap tape was used on all control surfaces. This was the only plane at Elmira that I noted with this arrangement. It was probably due to the fact that the hinge tape really grabs one's eye on those long ailerons; but my plane was built to fly, and not to be judged. I found many of the scale planes at Elmira fitted without any type of gap seal. I don't know why that was; maybe the loss of efficiency is not as much a concern when one is aero-towed to 2000 feet. Most of the planes were covered with UltraCote Plus, a self adhesive covering that is very resistant to developing wrinkles on long, slender wings. One flier used thin plastic strip hinges on his ailerons; the flaps were inserted under the obechi skin. He then covered the entire top surface with UltraCote Plus, in one continuous piece, that bridged the hinge line. This gave an excellent finish. His flaps and ailerons were hinged on the upper wing surface. Yes, even the flaps; not too many full-size are capable of lowering flaps more than 20 degrees, anyway.

Most all the wings I saw were either balsa or obechi over foam; Robin Lehman had a plane with molded glass

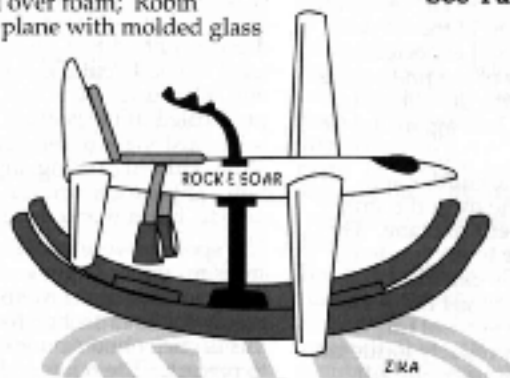
wings that was of very high quality. No glass bagged wings were seen at all, probably because they are so difficult to finish.

The only thing left to finish on my 24 was the nose weight installation. I cut out an oval piece of 1/4" aircraft ply that was through bolted with a 1/4" 20 machine screw that was epoxied in place. Three small, lead bricks were cast and drilled out to fit over the exposed thread of the bolt. A self locking nut secured the entire assembly. This arrangement took a bit of time, but this fuselage is so large that a dislodged weight could easily travel halfway down the tail.

I didn't have time to detail the cockpit, so I placed the interior cockpit tray inside the canopy, tacked it in place with hot glue, scribed a cutting line, and cut off the excess. I later permanently hot glued the canopy onto the tray, and gently sanded the canopy to the bottom of the tray flange using my 6" stationary disk sander. Well, that's it. These scale planes are not that different to build than the standard thermal duration models, especially since so many items are pre-fabbed. There's actually more room to work inside the fuse, the controls are slightly different to rig due to the long length of the fuselages, and weight is less of a factor.

My next scale building project will be to glass bag wings and a tail for the Vikings Models U.S.A. 1/5th scale Nimbus II fuselage. I'll be sure to apply the lessons learned on this project to the Nimbus.

See Yuh! ■





**THREE + 1/2
PEAS IN
A POD**

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2M SOARFEST '96

Mike: About a year ago, Paul mentioned that he wanted to organize a 2 day, 2 meter event, with 6 rounds "called-flight-order" on Saturday, and 4 rounds on Sunday. There would also be a raffle, T-shirts, decals, lunch truck, porta-pottie, and whatever else was needed for the whole nine yards.

Curt: I kinda liked the name "2M SOARFEST '96".

Ron: The name was Curt's idea, but our club, Silent Wings Soaring Association (SWSA), agreed to host it at the local flying field, Las Palmas Jr. High School, in Covina, California. Club President, Pete Olsen, volunteered to C.D. the event.

Curt: The '1st' Annual "2M SOARFEST '96".

Ron: Ya, well anyway, we anticipated that about 80 - 100 pilots would attend, to take a shot at the 1 meter, all grass, "happy-faced", 20 point, landing circles.

Paul: There was one sad face...

Ron: Ya, that's right! It was the one next to the fence, under the tree, between the backstops, and by the dugouts, where they were having the Little League game.

Paul: Yep, that's the one!

Curt: I might add that "2M SOARFEST '96" was also an AMA sanctioned event!

Mike: Yes, Paul thought of everything... Except, the name. The awards were for 1st through 10th place, and the trophies were beautifully hand-

Howard Little with trophy helmet.



crafted gliders, artistically fabricated by noted wing designer, Ben Matsumoto.

Curt: The base of the trophy was engraved with the name "2M SOARFEST '96".

Ron: Rounds 1 through 6 on Saturday were 3, 10, 5, 10, 7 and 5 minute tasks. On Sunday, there were only 4 rounds of 5, 10, 6 and 8 minutes. Making the times on Saturday seemed to be a bit easier than Sunday, as there was a lot of heat and humidity, which held the workable altitude down to about 1000 feet. This is unusual for our field, as the "noon balloon" can take one up to almost three times that height.

Curt: "2M SOARFEST '96" sure had its share of smog. I never saw the mountains, or the lunch truck, all weekend.

Mike: Well, with this being our first effort, a few things didn't happen as planned.

Paul: Got that right! The turnout wasn't as large as we expected, our T-shirt order was a little messed up, and we all got really tired of hearing Curt ask us when the lunch truck was coming!

Mike: We did have a problem with negotiating the catering truck, but everybody (except Curt) managed to break away between rounds to grab something to eat.

Ron: I think it was Ben Matsumoto that brought him something on Sunday, just to shut him up.

Paul, Mike, Ron: Thanks, BEN!!!

Curt: "2M SOARFEST '96" was also filled with lots of controversy, some gizmos, and a few interesting sail-planes.

Mike: Ian Douglas had a compact, on-board device that he copped from some rocket guys in order to measure altitude at the apex of his launch. It was about the length and width of two AA batteries, end to end. For example, it may beep four times, then twice, then three times, meaning 423 feet.

Curt: John "JJ" Johnson was flying this pink creature in order to show off some wings that he is considering putting into production. He neglected to give me the specs., but they appeared to be a good quality, glass bagging job; they looked pretty stout going up our 420 lb. test, 150 lb. monofilament Bat winches from Bob Harman, Basic Aircraft Technology, in Utah.

Mike: Was that a plug??

Ron: Glenn Clifton ("3 Peas + Sweet Pea's" hired builder) showed up with his sporty Barracuda, only to find that during the official pre-flight measurement, that he couldn't compete without hacking off both tips. Somebody immediately came to his aid with an X-acto blade, a razor saw, and a tape measure; it was one done deal.

Curt: A Wing Vasectomy... Another first for the "2M SOARFEST '96"!

Ron: A few Vaquero's blew a portion of their horizontal stab on launch. All the gliders survived, and designer, Tom Finch, supplied the pilots with replacement parts.

Curt: Ya, the Vaquero is really a great-flying ship, and I'm sure that Tom is busy working on a fix. "2M SOARFEST '96" was a true test of man and machine.

Paul: Kind of like the Indianapolis 500 of 2 meters!

Curt: SOAR HEAD, now I know why you're #1 Peal

Mike: Pilot Henry Arance was flying a neat, little T-tail he calls DOSEME



This is what happens when the wings are too long...



Mike Ratner

(means 2 meter in Spanish); it has a 660 square inch wing area, weighs 51 ounces, and has a 7037 airfoil. It's a nice flying glider, and was built around a fuselage we once used as a club project.

Ron: Ben Matsumoto tried low tech, and flew a rubber band-equipped ARF Windstar. He was doing rather well, until he re-kitted it when the winches decided to show him who was boss. I want to add that, under normal conditions, with standard winches or high-starts, the Windstar is a great trainer and really quite durable. Ben will be the first to admit that he pushed it well beyond what it was designed to do.

Paul: Heck, his Thermal Eagle would have flinched on them Bat winches!

Mike: The airplane that received most of the attention was Ron Vann's latest kit, the 2M Laser. Curt finished 5th, with about 15 flights on it. And that includes this contest and our club monthly. If Curt can do that, just think what a good pilot could do with it!

Ron: Ya, but the best part was that Paul loaned Curt the Laser just to fly the contest. We all know how he bad-



Team Vaquero: Ian Douglas, Mike Regan, and Tom Finch.



Merrill Brady with 2M Grand Illusion.



Eber & Marian Graham

mouths 2m's, and we also know he's too cheap to buy one; it was obvious he liked this airplane, because he criticized himself when he messed-up, instead of yelling at the glider like he usually does! He kept mumbling things like, "This flies like a big airplane," or, "I gotta find out what Vann did to this 7037."

Mike: No, the best part was after he landed on his final round, and Paul told him to remove the receiver, because the plane had just been sold to some guy at the field. That was great!

Curt: Well, it was hard to let her go! We had a history together, and her fuselage was still warm when we said good-bye.

Paul: Believe me, Curt, that was only because it was about 100° in the shade!

Curt: Oh...

Ron: Of course, we want to thank our boss and #1 Pea for sponsoring us.



Mike Deckman's 50th birthday present from the other "Peas"...

California Soaring Products had three company pilots finish in the top ten: Mike (Super-V), John Yee (Super-V), and His Humbleness, Curt Nehring (2M Laser).

Paul: My pleasure, SOAR HEADS. And, thanks to all the pilots that supported the effort, to Mike Ratner for a tremendous job at programming and manning the computer in the scoring tent.

to Eber and Marian Graham for handling the impound area with a smile, to our sponsors, and to all the folks at SWSA that really made a difference. We couldn't have done it without you, and that comes from the heart.

Curt: Ditto! We got a lot of positive feedback and, based on what we heard, we're gonna see what it takes to try it again next year.

We also want to take this opportunity to say thanks to all of the folks that mailed us their suggestions for naming CSP's new open class contest glider. We really appreciate all your efforts, and were somewhat stunned by the vast response. So, please watch for the Mystic, Paul's name choice, new exclusively from California Soaring Products.

Mystic's First Competition

Curt: The event was a simple, and

fun, club contest format, CD'd by M&M Glider Tech's, Merrill Brady; it was 2-4-10, pilot's choice, but one of each needed to be flown during the three rounds. There was a 10' landing tape, secured at both ends with rubber bands and nails; some part of the glider had to be over the tape in order to get the 50 points maximum.

Two and four minute rounds are generally, easily accomplished with the high tech stuff, but the strategy was knowing when to go for the ten. You might have four minutes in the air, but was there enough to make the long flight?

For the past several weeks, we've asked many pilots to get some stick time in on the Mystic for obvious reasons. We need the feedback. Paul didn't set any ground rules; he just gave them the transmitter and said, "Go and play. We'll see you in about a half hour!" He'd wander off and have a couple of cigarettes with fellow SOARHEAD, Ron Adams. A little later, we'd have our pilot's report.

All the information on the Mystic's flight characteristics has been positive; most just commented on the changes they'd make based on personal flying style, etc. Mike originally programmed the Mystic a bit on the soft wide, with a good intermediate setting for the average flier, or for someone flying the plane for the first time. In my opinion, I wouldn't have changed much; I felt the Mystic very competitive with these throws, and recommended using them as a starting point in the instruction manual.

However, somewhere in moving the Mystic from Vision to Stylus, we misplaced the numbers. In the interim, several pilots have regularly played with the programming in order to meet their individual needs, while flying Mystic. This proved to be an unexpected learning experience for me.

In round one, the sky was one big boomer; everybody was going up; 10 minutes should have been a piece of cake. Mystic was a little squirrely on launch, however, got sideways, and

popped off; there was only one allowed for the entire contest. I checked the settings, put in a couple of clicks of down, and re-launched. The plane was flat, zoomed lousy, and left me with no altitude; this was a real handful, no matter what I did to get it trimmed in flight. I was back on the ground in a little over 5 minutes, had missed the landing and, from a points standpoint, was out of the race. Sure, I took a chance on making the time, because the air was there (bad choice) but, while I wrestled Mystic around the sky, I kept wondering what had happened to the fantastic ship that I had flown just the weekend before!?

Well, into the second round, and half way into one of Mike's scuba diving stories, I pulled him off the tailgate of his truck, got the pin, and talked him into reprogramming Mystic, as close as he could to the original throws. I flew rounds 2 and 3 with 3 clicks of up, made my times, and nailed my landings. (Thanks, Mr. Deckman!)

I am certainly not saying that flying a 2 and 4 minute round is anything significant, because Mystic could easily cruise-out that amount of time from launch height; but to blow an opportunity to place because there were too many thumbs in the pie has been a valuable lesson learned by me and the entire Mystic crew. Test flying this glider has been a rewarding experience, and we'll continue to keep you posted on our progress.

Laser 2M

Curt: I'm not a big fan of 2M gliders and, over the years, there's only been a handful of them that made any kind of impression. To this day, I've never seen a built-up wing that could make a contest winch groan more than the late Hobby Horn's Gnome 2M, a scaled up version by Bob Sliff (F5B), and Ross Thomas of John Lupperger's original HLG. It's no longer available, but there are still a lot of "knock-offs" being produced throughout the country. The sexy Falcon 600 worked nicely, but never seemed to have the success achieved by its big brother. Of course, at that time, the movement



toward so-called high tech 2M ships had just begun, and the interest wasn't near to what it is today. So, along came the Banshee, and with its giant leap in performance, most likely due to a major shift in airfoils, also came a seemingly inflated cost for something that was delivered in such a small box. Levoe's well-engineered and contest proven, glass-bagged V-tail has had a long run at the top of the heap with its eye-popping ballistic launches; because of its proven track record and rugged reliability, it has been able to keep pace with a newer generation of less expensive, obechi-winged ARF's. More recently, Tom Finch, Sailplane Systems, asked me to fly his 40 oz., hollow-molded Vaquero. This is another great flying 2M that I highly recommend for the active competition pilot. It's definitely not for a beginner, and it's not cheap, but it's an excellent value for what you get. So, bring your Visa.

While many of the new breed, 2M, thermal duration gliders are slick in appearance, and promise spectacular performance, most of what I've seen would need some coaching by Richard Simmons, in order to be used for anything other than a weekend sloper's back-up, fun fly plane. One current exception, perhaps, is the Barracuda.

The fuselage is odd-looking, so you either love it, or hate it. But, give it a chance, because after awhile, it kinda grows on you. The Barracuda handles more like an open class ship, lands on a dime, and is by far the best 2M glider I have ever flown; that is, until this past weekend.

Once again, Ron Vann knocked my socks off with his latest offering, Laser 2M (not to be confused with Bob Sealy's 124" Laser). According to Jim Thomas (RCSD 5/96, page 9), this wing is identical to the Barracuda. Well, not exactly, but it's close. In a side-by-side comparison, the Laser 2M had the same amount of flat area, but the ailerons are noticeably longer. This airplane is also a lot faster than the Barracuda, which makes me wonder whether or not the "B" we've been flying has the same thinned and modified, double-tapered 7037 that the Laser 2M sports. Our test models zoomed nicely with a kick-off the monofilament, but I felt the launches were a bit shallow, and might be tempted to move the towhook back a bit, or even try a tad more camber. Our company builder, Glenn Clifton, who also built a Barracuda, assembled it per the plans; but I still think the hook location is a little conservative.

I like the look of this fuselage. Basically, it's a Spectrum without the "T". The vertical fin and rudder are appreciably larger than the Barracuda, which appears to help in the tail-moment department. The Laser 2M penetrates well through sink, in or out of reflex, signals lift like a champ, and thermals best with a clean wing. Camber doesn't have a great deal of effect in slowing this bird down at thermal altitude. It likes to be flown on the fast side, and might be a challenge for any pilot below an advanced/intermediate level. I didn't have any problem blowing-off the last couple of thousand feet, before entering the pattern; Laser 2M was solid and predictable. Surprisingly, landings were extremely slow and controllable.

Ron and I butted heads several years ago over a Falcon 880 that I was

reviewing for another periodical. At that time, he had taken over some of the production for Mark Allen. I ran across a slight problem with one wing panel. Ron sent me a new set of wings, faced, and with leading edges installed. Since then, I've owned a Spectrum and two Prisms, and have flown many examples over the past few years without a hitch. With the introduction of the Laser 2M, it's obvious that Ron's craftsmanship, sense of business, and attention to quality control will set a new standard for the industry. At \$295, the Laser 2M is a heck of a deal and, as it stands right now, Paul is selling out of them as soon as they arrive. The Bob Duke instruction manual, matching wood-grained wing panels, and carbon fiber wing rod are just a few of the added features that are going to make the laser 2M the hottest selling kit on the market, today.

Ron: In my last episode, I shared my experiences with Spectrum Enterprises' Condor after having just finished a flight with my Super-V 2M. Well, alas and alac, my Super-V is no more. She died in a violent mid-air with one of our club member's Falcon. Sorry, Jim. It's not easy to replace a Super-V; the waiting line is long, and the cost is considerable. Fortunately, along comes the Laser 2M.

Paul and Glenn had just finished an evaluation model; once again, I got to fly one of CSP's planes and offer my opinion. In other words, Paul wanted me to write another article called "The Price You Have to Pay to Fly His Planes".

Well, she flew as good as the Condor, and I didn't get a half hour flight (or a beer), but I was happy with the way the plane floated in light lift. The flaps were very effective, it slowed down nicely for landing with no ballooning, yet still maneuvered responsively.

That was Saturday morning. By Saturday evening, I had a kit in my hands; I was ready to build. Only 2 weeks were left before the 2 day, 2 meter contest, and I needed a plane to fly.

The kit is very well done. The fuselage is as good or better than any I've seen, there were very few pinholes, and kevlar was nose-to-tail; it has a slide-on nose cone, and very nice lines. The wings are obechi over foam (popcorn) with basswood leading edges, sub-trailing edges, and flaps and aileron leading edges. The balsa tips were the perfect weight and section for carving and sanding; they were not so soft that they could be easily dinged with a bad tap, nor were they so hard that one could wear out 3 sheets of 80 grit sandpaper, while trying to get the proper shape. Heck, even the obechi sheeting matched from left to right wing.

I used 341 and 351 JR servos in the wings and fuselage; they fit perfectly. The building instructions and illustrations were excellent, and I didn't feel a need to change a thing.

The wings and stabs were finished with 2 coats of flecto, water-based varathane, which was brushed on with a foam brush; the fuselage was left natural. A nose tooth and skeg were added, because the event called for landing in a 1 meter circle. (Paul's idea!) The finished weight came in at 41.5 oz.

The plane was completed the day before the event; I was able to do two test flights the night before, while setting up camp. Mike Deckman did the first flights, and had the plane pretty well trimmed out for me.

My results were not spectacular. While I was very comfortable flying the Laser, I needed more time in order to be proficient on the sticks. Curt, on the other hand, with about as much pre-contest flight time as I had, finished in fifth place.

Without the pressure of contest flying, I find myself enjoying the Laser, very much. It launches and thermals as well as I remember my Super-V doing, but I think it slows down much more, when coming in for a landing!

Until Next Month... Boomers! ■

SOAPBOX

Designing the Barracuda The 7037 Myth, and Other Thoughts...

...by Brian Agnew
Wharton, New Jersey

Because of obligations over this past year, I have not been in a position to actively fly and promote the Barracuda. Hopefully, in the next couple of months, this will change. For now, I would like to take time to explain some of the concepts behind the design.

Undoubtedly, the prime motivator and the initial objective in designing the Barracuda was to offer something different. The kit itself is conventional in its use of materials, and in its pre-fabrication; but, intentionally, that's where any similarities to other designs on the market ends. The design was self-serving, in that I was looking for something that would cure my own disdain for a market absolutely saturated with nothing but "Ho-Hum" designs. Where, oh where, has all the creativity gone? I've also been reaching back for the good old days, so I was also motivated by a feeling of nostalgia; the concept of the fuselage was actually used by a friend of mine, John Gunsaulus, years ago. Having been away from the hobby for over a year, I can tell you that this design is still the only thing on the market that makes my heart go "pitter patter".

I love everything about the fuselage. It has low profile drag, its tall enough to land with full flaps, its sexy, and best of all, it's generic, meaning that the sides of the fuselage are flat; it can be used for any set of wings that one has laying around. This is a great fuselage to use as a test bed if you're one of those people that likes to experiment. During the development of this design, I used the original fuselage as the test bed for over a half dozen different wing planforms. My latest project uses the Barracuda fuselage with a set of Bird of Time wings, and it is one neat looking airplane!

The open class Barracuda has the SD7080 on a double tapered wing with polyhedral pressed into it, like I did on the Banshee 2 meter. This feature adds

considerably to the overall stability of the design. It is also a pain to do, and I know of no other kit on the market which includes this feature. I decided on the 7080 because I like its wide range in performance. It is similar to the 3021, but seems "cleaner" with an excellent L/D, and good hanging time. Having flown a lot of other designs, and a lot of other sections, I can tell you that, despite what the rest of the world may think, and despite what the market is asking for, the 7037 was never even considered.

The popularity of the 7037 is something that has baffled me from day one. When compared to the other sections, in my experience, the 7037 suffers everything and offers nothing. It sacrifices far too much lift, and is the last thing in the world I would want to be flying in light lift or dead air. (Personally, I believe that the RG-15, 57080, and the E-387 are all superior to the 7037. The only real success, that I have observed with this section, are when a lot of sacrifices are made in the strength of the airframe in order to bring the wing loading down. At low wing loadings, the 7037 becomes respectable. On the computer, I have been told, there is nothing better. There is the computer and there is the real world...

The only reason I can imagine, for the success of the 7037, is that people have gotten on the band wagon, and have blindly accepted that this is the section they need to fly to be competitive. Well, now we have a situation where this is literally the only section available on the market, and consumers just don't know any better. When I've confronted pilots about the characteristics of the 7037, they always say, "Well, gee. You know, I've noticed that, foo..." These seem to be the same guys that fly in circles in sink with a dozen other planes and scratch their heads when they only get 4 minutes. There is safety in numbers, but it's not always the place to be. I know these seem like harsh words, but I've been sitting on the sidelines watching this phenomenon for several years, and now I feel like screaming, "WAKE UP!"

Now, having said that, I will admit that I've heard nothing but great things

said about the 2 meter version of Barracuda. If the truth be known, other than designing the fuselage, I had very little to do with the 2 meter. After finishing the plug and the mold for the fuselage, I concentrated on the open class Barracuda. By the time that I had a product that I was satisfied with, I was committed to go to work elsewhere. The Barracuda 2M uses a wing designed by Ron Vann, which had been used on his Spectrum 2M. It is my understanding that this is not at all a true 7037, and actually transitions drastically from root to tip.

So, if you're tired of flying the same old thing, and tired of looking at the same old thing, I strongly suggest you invest in a Barracuda. Heck, it's a modular design, so if you're determined to fly another airfoil on another set of wings, just order the fuselage. The kit, itself, is definitely a limited production item. (I've made all the kits, and I won't be producing anymore, though the fuselage and after-market parts will always be available.) So, you don't have to worry about the Barracuda becoming just another airplane.

Finally, I would like to suggest that it is time to start thinking about introducing a new class for competition. I feel strongly that, to the degradation of this sport, things have become too expensive. We have reached the point that when a beginner is ready to step up

from a Gentle Lady or Spirit (nearly the only polyhedral, wood kits still on the market), and in order to be competitive, they must invest \$550 in a computer radio, \$400 in a competition sailplane, and \$300 in servos. I would like to see an official class introduced that would limit control functions to 3 (rudder, elevator, and spoilers), restricting designs to polyhedral, only. The Nostalgia event at the Nationals is the closest thing to this that now exists, but it eliminates a lot of readily available designs. I think this new class would go a long way to bringing back the "lost art", or more appropriately, "lost hobby". Maybe, some day, soon, people will once again be able to say, "I built that!"

I would also like to challenge the top fliers in our sport to start flying planes and equipment that are within reach of the average modeler's skills and bank account. I think that it gives perspective to realize that, as much as our sport has changed in the last 20 years, a perfect score is still 7:00 with a 100 point landing. At the LSF Nationals, 20 years ago, Mark Smith scored 3 perfect flights in a row flying his little, 2 channel Windfree. I'd bet my last dollar (which would be rather easy for me to do right now), that Mark Smith would still dominate with his Windfree, today, flying against the hottest pilots, with all the latest in planes and equipment. ■

thermal activity and nearly calm conditions.

The Bullet Bird catapult glider was incredible. When released, it would climb slightly, dip slightly and then climb straight up for several hundred feet, sometimes being punctuated with an axial roll. The young catapult pilot was quite good, I thought, having quick reflexes and good skills in guiding it. The model glided fairly well despite the robust construction and small wingspan. I believe the weight was only 11 oz. The Bullet Bird was under the display tents at the sod farm during the contest and is available from Finney's Hobbies.

Friday morning, I went to the cross country site and took some photos. The most popular XC model was the



Aerial photography taken on Sunday, June 23, at Mid-South Soaring Championships, at about 460 feet by Mark Wales' camera/altimeter-equipped Windsong.



Bob Johnson and his very nice Peregrine. Lee Murray photo



Chuck Anderson and his Legionnaire. Fred Mallett Photo.

RnR SB XC. There is plenty of room in this fuselage for gear; landing capability is excellent, and it has good handling qualities. The lift was marginal up to about 1:00 p.m., which is when I wanted to get over to the hand launch glider site. There were some interesting custom ships by Mark Barbee, David Godfrey and Pat Flinn. Getting ready for the high speed ride over gravel roads, Pat set up a folding chair in the back of the truck. The Mark Barbee-Lance-Brill team had an inclined lounge seat made from a plywood board that they used. Their thermal sniffer receiver was a scanner, and they used an amplifier to make the Thermal Sniffer signal more usable. The little transmitter seems to be the weak link in Thermal Sniffer technology (probably limited by the FCC). I understand that they are out of production now, and service is limited. The parts will be getting hard to find soon, if they aren't already.

Richard Tiltman had a prototype of his Synergy V. There has been some weight shaved from the Synergy, and it looks like a ship that plenty of thermal soaring pilots would love to have.



Matt & Gail Geusin of Composite Structures Technology from California just dropped in for the week-end. They were working their way back across the states from the east coast. Russ Behr photo.

The hand launch guys were suffering under the heat, but there were plenty of people getting their max times. That is one nice thing about the sod farm location; there was plenty of lift and sink to be found. Buzz (Nobusuke Tokunaga), who is the Japanese HLG champion, was there and was doing very well, although he finished 5th.

The Thermal Soaring event on Saturday had several "contestant friendly"

My View of the MSSC

...by Lee Murray
Appleton, Wisconsin

The '96 Mid-South Soaring Championships was a pleasure for me, my wife and son. The weather was a little hot, but it didn't kept us from enjoying the event. I wanted to jot down a few notes apart from the standings, which I'm sure you'll find elsewhere.

I came down on Thursday, making the 12 hour trip from Wisconsin. That evening, across from headquarters at the Holiday Inn, was a flying site for hand launch gliders and a catapult glider, the first and only one I have ever seen. The hand launch glider guys were getting 30 seconds pretty consistently even with the lack of any

features (triangle landing zones with nothing to measure, fly then pick your task, flight group order was not scrambled). There were plenty of thermals on Saturday. Thanks to the liberal contest format, where one could choose a 4 minute round for a bad flight, I stayed in the contest even though I had bad trim set up on the first flight. Thanks to Bob Johnson, who reminded me that I had an elevator trim pre-set I could use, I salvaged the flight when I couldn't get enough down trim on the first flight. Bob is an excellent modeler and had, perhaps, one of the nicest models on the field, an Airtronics Peregrine. A memorable event occurred when a turkey walked onto the field. Struts put in an appearance, and displayed his feathers for us, before he left for home.

At the end of the rounds, the raffle prizes were given out. There were more prizes than I had ever seen at a soaring event on this side of the continent (5 radios, 15 sailplane kits and many other prizes). The last prize given was for a hot air balloon ride. The balloon was being inflated as I was leaving at the end of the day.

At the banquet, Bob Champine gave the first after dinner speech, which included a summary of his career in aviation as a pilot. Bob had a leading role in the development of many and varied aircraft. I believe he was the head test pilot for NACA, and has flown over 140 planes with an outstanding record of success. In some cases, he said that bailing out was not really an option because of some design limitations.

Tim Renaud from Airtronics discussed where we are going in this hobby. The customer base of R/C soaring equipment is getting older and will be shrinking, if not so already. The computer radio has done much for the sailplaner in allowing him to experience high performance in his models. The expense of the common equipment now being used may be somewhat of an impediment to new, younger people getting into the hobby. This is something that is being addressed with the reintroduction of two and three channel wood sailplanes. Tim suggests

that there should even be a special class for models with two directional control channels plus a glide path control. Many classic models really can't be used today because of advances in launching equipment, which would over stress the spars. Thinner, but sufficiently strong, servos will be coming out, some are sold in Europe, today. In my opinion, the whole Renaud family is to be applauded for its long term support of a business which can't be all that lucrative, given the size of the sailplane market and the cost of the products.

Sunday's thermal contest was off to a great start with Cornfed (Fred Rettig) providing a morning devotion. The size of the event was a little smaller, and the lift harder to locate. The number of rounds was reduced to allow people to get on the road a little sooner, but there was still plenty of fun to be had. The best part of the contests, and a good reason for my attendance, is to renew acquaintances and meet new friends. I don't seem to have the stuff to win contests, but I now come to experience the camaraderie which surrounds them. Taking in the sights in Memphis was also a pleasure. These included Beale Street, an area where blues was celebrated, Mud Island, the trolley car and the Peabody Hotel.

Thanks to the two clubs, North Alabama Silent Flyers and Memphis Area Soaring Society, which sponsored the contest. The equipment was excellent and the members didn't let up from providing a high class contest under very warm conditions. ■

Nightmare in Memphis "He's Ba..ack!!"

...by Jerry Hossom
Atlanta, Georgia

Along the launch line, and in the tents lining the field, a sudden hush focuses on what is about to happen. Mothers clutch at their children, and even grown men look apprehensive, glancing about them for a safe place to hide.

No, it's not Freddie Kruger. It's only yours truly, up for his second launch at the Mid-South Soaring Championships

in Memphis. The warning had come from the fellow working the retriever on winch three, as I made my way toward winch number five for my second "flight" of the day. And, unfortunately, the Nightmare wasn't on Elm Street, it was quivering in the heart of this rookie sailplane pilot at his first soaring contest with an airplane that had a very severe problem. At that moment, though, exactly what the problem was and what might be done about it was unclear.

My first launch at Mid-South was unquestionably the most exciting thing that happened in Memphis on that hot, steamy Saturday morning at the sod farm. About fifteen feet up the launch line, my new 2 meter Barracuda, purchased just the week before from another builder, took a hard right turn, stalled, and looped back to the left; then it snap-rolled left, despite my giving it full-right aileron on the stick, stalled again, snap rolled again, scattering spectators in all directions, and then stalled one final time before landing upright, atop one of the tents alongside the launch area. Somewhere in that hideous sequence of maneuvers, I'd managed to croak a feeble "HELP!" to my two fellow club members, Trey Finney and Tim Foster, who were there assisting my first-ever, competition launch. Unfortunately, I was too quickly beyond help, and firmly in the grasp of fate.

I'm told that after the plane finally planted itself safely on top of that tent, and it was determined that no one was injured; the crowd gave me a standing ovation for the comic relief in an otherwise tense and competitive event. I vaguely remember someone walking up to me holding the Barracuda by the tail, asking "Does this belong to you?" Since no one else was standing there looking stupid, I could only mumble, "Yes," and take the offending creature from him. My brain wasn't functioning well at that moment. I don't remember the cheers at all.

The relaunch on my first flight lasted an indeterminate amount of time, and I have no memory of where I landed or

if I even did. My second flight, particularly after the warning issued by the winch operator to all in attendance, was similarly forgettable, and I have no recollection of its results, either. During these first flights, though, it was finally concluded that misaligned wing incidence on my glider created a condition that required full-right aileron trim for launching; then full left trim for normal flight. The trim flight I'd conducted the night before resulted in proper flight trim, but catastrophically wrong trim for launching. Hence, the tip stall and resulting rolls on my first launch.

By the end of the second flight, that problem was finally understood if not fully resolved. Now, as the day wore on, my concerns began to center on the fact that I was flying this glider, my first with more than two channels, in a contest without ever having made a successful thermal turn with it, one that didn't result in the plane plummeting fifty feet for every foot it gained.

As I squared, bracing myself for the next launch, I could see eyes turning in my direction, and heard nearby conversations pause in mid sentence. Tim tensioned the launch line, and released. The Barracuda headed straight out in its characteristic flat launch (no launch mode on my radio), rising significantly only after it was thirty or forty feet out, but finally zooming off the line and achieving a respectable, if not laudable, altitude.

Conversations returned to normal, and Trey guided my rubbery knees through the tangle of other flyers to the most distant landing zone where the fewest possible people would be injured in the event of a second "incident". Somewhere, during that march across the field, the Barracuda stumbled into a thermal, and Trey said, "Hey, you got lift. Turn left (or maybe it was right)." Then it happened, I actually made a thermal turn. I even gained a full six inches of altitude.

Then another six inches, and before I knew it, I was crashing back to earth with a five-and-a-half minute flight!

Of course, I was nowhere near the landing zone, my knees were shaking worse than ever, and I remember wishing that I'd brought my Olympic 650.

There was only one small thing wrong... I still had to make two more flights, and I genuinely didn't want to. In fact, had I really crashed the Barracuda and it been rendered unflyable, I would likely have been quite content to call it a day and head back to the hotel with its welcoming bar and cold beer. With the plane intact, I still had to perform.

As Tim, Trey and I approached the launch area, I noticed they'd posted the scores for the first three rounds. I can't imagine why I looked, but in the Novice division listing was the name Jerry Hossom, solidly in fourth place. Granted there were only nine flyers in Novice, but I was number four.

Tim scampered off, leaving Trey alone to coach me through what needed to be a respectable flight. I had used up my short flights, and now had to get eight minutes on both of my last two. The launch went OK. Trey guided me again, through the mass of flyers, toward that same last landing zone, well away from spectators. Then it happened, a thermal. Trey calmly said, "Come right. OK, hold it... Now, right again. That's it. Keep circling..."

"Four minutes." I could hardly believe my ears. I'd been up four minutes and was actually higher than my launch altitude.

"Seven minutes. All right. Start coming down. Turn left, again... Now bring it in." Trey's quiet words brought me around smoothly, approaching the landing zone in remarkably good shape, until I deployed the flaps, and over shot the landing by about 20 feet. I'd flown an 8:04 for an eight minute round, and while I didn't get any landing points, I still had a good flight.

Later, for the first time that day, I approached the flight line for my final flight feeling pretty good. The last flight had gone well. I knew I could do

eight minutes, and all I needed was one more.

As we got ready to launch, Trey said, "This time, when you zoom off the line, turn it off to the right. That way you'll get the altitude and where you want to go at the same time."

Tim launches, and the Barracuda shoots out and up. "Stay with it. Not yet..." Tim's coaching me on when to kick off the line. "All right! NOW!"

I zoom, beginning to pull right as I start climbing. It's just beautiful. That bird just shot up, rolling gracefully to the right, just where I wanted it to go. And then it happened! "I'm inverted! Now what?" I pull over, looping around to correct the plane's attitude. Once more Trey says, "You've got lift, come right. OK..."

What's wrong? I'm stalling; every turn is dropping me twenty feet and nothing seems to correct it. The situation's going from bad to worse, and like it or not, I'm coming down. And, then Trey quietly said, "Your flaps are down!" I'd just flown the last minute or more at half flaps, which quickly explained my inability to stay in the thermal and the rapid descent.

In the final part of the turn, I pulled up-elevator, stalled, then plummeted into a short dive that culminates in a memorable dork, a cloud of brown dust rising over the small hillock I'd just cratered. Ignominious defeat. All that remained was walking out into no man's land and recovering my Barracuda.

To say my first ever sailplane competition was eventful is a serious understatement. In my entire life, which covers a broad and occasionally dramatic range of experiences, I can't remember ever experiencing the scope of emotions that surrounded that day in Memphis. It was thrilling and terrible, all at the same time. Will I do it again. You bet. What else can I say?

Until the next time you hear, "He's Ba..ack!" Jerry, not Freddie that is...

Happy Landings! ■

FIGHTING FOAM & HEAVY IRON

Volume 1, Number 1

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Fantastic Foam

So, you say, "I love my foamies, but they start losing their beautiful, aerodynamic form after the first weekend's fighting." Yep. Once you smack a few good dents in that white styrofoam, it starts losing it quick. You even tried blue foam, and that was a little better, but not much; and you paid a huge weight penalty for it. So you end up just slapping more tape on it to heal its wounds, and the weight keeps going up; it doesn't really get any cleaner. What's a dedicated combat flier to do? Well, they're cheap, so you could just build another. But what if it's looking just as sorry after a few more weekends?

Well, have I got something for you! At the Carnagesaurus II contest, we saw the competition debut of Pat Bowman's Roughneck, which is made out of an amazing substance called Expanded Polypropylene foam. It looks just like the familiar white styrene foam, but it's resilient - it won't dent! I managed to obtain some of this amazing stuff, and now I'm going to spill my guts on it, so here goes...

Where did it come from? The professional packaging industry. This stuff is considered the very best of all packaging materials for heavy but delicate items such as antique furniture, computer components, etc. It goes by some other trade names, too, like "Eperan P" or simply "EPP" and comes in two densities; 1.3 lb./cu. ft. and 2 lb./cu. ft. The stuff I finally obtained (low density) comes in 3' x 4' sheets, about 7 1/2 inches thick. The supplier was able to cut, or "split" it into very manageable 2 1/2 inch thick sheets for me. It's not cheap, but it makes planes that have a life-span magnitudes greater than styrofoam

could even come close to!

So, what are its properties? Well, for starters it's impervious to just about every caustic chemical known to mankind. It stands up to prolonged exposure to UV radiation and is incredibly heat resistant. It's flexible, too. You can bend a piece of it to a severe angle before it finally breaks; it's much more flexible than styrofoam. It has true rubber-like dimensional memory. You can push your thumb into the sheet a whole inch and it bounces right back! It saws beautifully with the scroll saw or the bandsaw, with the same blades you'd use for wood. It hot-wires pretty well, and my Feather Cut machine had no trouble with it, though I had to use full-blast heat to get good speed and smooth cuts with no sagging. I also found that using thick cutting wire kept it from healing back onto itself. Now you're probably thinking, "Dave, this is just to good to be true! What are its negative attributes?" There's some. Our old favorite, vinyl packing tape, hardly sticks to it at all. The filamented strapping tape is a little better, but not much. The only way to get even a passable bond is to spray the foam with 3M Super 77 contact cement before applying the tape. Hmmm. This is how Pat had been covering his own planes. Silicone sealant is the only thing I've found so far to glue it with that has the flexibility we're looking for. I figured there must be a better way to cover it, though, so come along with me to the lab and I'll show you what finally bubbled out of my beakers.

I built myself a plane. I had already begun development of some foamie warbirds, 'cause heck, if it doesn't have national insignias and a canopy, it ain't a real airplane, right? Anyway, I forged a P-51 from the new wonder stuff, assembled it, and took it out to the hill to let my amigos punish it in severe aerial combat conditions. This first example had no tape on it at all - just raw foam. I reasoned that it was rubbery enough that you couldn't possibly tear it! When I arrived at the slope, nobody was around, so I put it up for a check ride; it flew great, even with its slightly rough finish. The boys

started trickling in and putting up their planes and, naturally, started abusing my pretty, new puny. After about three average, two-Tylenol engagements, I was losing chunks. Definitely needed tape to stand up to the sudden shock loads of hard collisions. I nursed the poor devil the rest of the day, and came home with many blown-out chunks, and a good sized tear across the forward fuselage.

So, I broke down and decided to tape it. I glued the recovered chunks back in with silicone. I had to paint it, which I did right over the foam. I painted it out with Testor's model paint, sprayed it with the 3M, then taped it up with plain packing tape. No strapping tape was used at all. This looked pretty good on my bench, so I was hoping this would be the Zen method. I took it out the next weekend, and it did much better - no lost chunks; but the dark, non-specular blue Mustang paint scheme sucked up heat like crazy and soon began to debond the tape. By the end of the day, she was looking pretty baggy. The good part was no lost chunks! Getting closer to Nirvana....

Hmmm. What about covering material? What about an Me109? Kill two birds with one stone. Since a few of my buddies were working on their own 'Stangs, I designed the Messerschmitt, so I could be the bad guy (improves empirical testing opportunities; heh, heh). This time, I decided to test regular iron-on covering materials. As I expected, the foam didn't have any trouble standing up to the heat of my covering iron, and I was able to use normal temperatures to apply film to it. I tried Ultracote (original recipe, not "Plus") and Monokote. Neither one stuck real good. I grabbed my trusty can of 3M 77, sprayed some on the foam, then attacked it again with film and iron. Eureka! The Ultracote stuck like gangbusters! The Monokote still didn't stick very well. I took the Black Ultracoted test sample out to the field the next day with "Test Me" emblazoned on it with a red Sharpie marker. True to form, the boys put it through its paces in the spirit of the Samsonite gorilla. They stomped, poked, smacked, stretched, bent, slammed and pulverized that piece of foam. To add insult to

injury, they left it sitting face-up in the blazing sun all day long! At the end of the day, that poor piece of black Ultracote was still holding to the foam ferociously - success at last. The edges were still holding tight, there were no bubbles, nothing. All right!

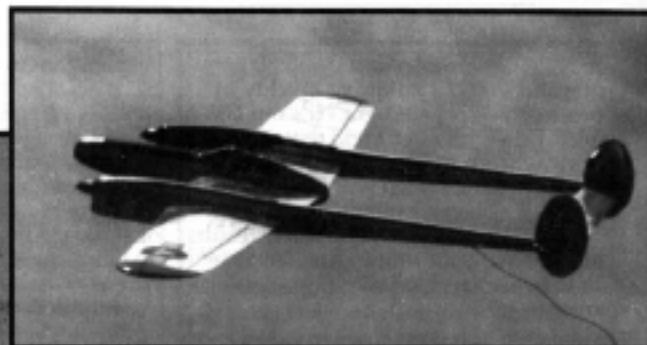
I dutifully covered my new Messerschmitt with the Ultracote. As you can see, this turned into the world's sexiest foamy ever, in my humble opinion. It ended up weighing about the same as our tape covered examples. It flew right into the fray on its maiden voyage. I hadn't utilized any tape at all this time, except for a 5 inch wide wrap around the wing root. I was hoping the Ultracote would be strong enough to hold everything together like the tape, but was wrong again... It got pretty torn up its first day out. Back to the shop I went.

I repaired the few tears in the foam, and studied the battle damage. Tears on the leading edge, and the fuselage longerons were blown to pieces in the nose area. I put packing tape over the film on the leading edges; no sweat. The fuse was a little tougher problem, though. Nose diving into the ground was causing the foam to expand laterally, which was blowing out the longerons. I decided to wrap the nose completely with strapping tape in "rings" around the fuse, not lengthwise. This would keep the foam from expanding so radically in nose dive impacts. I was able to lay down more Ultracote right over this layer of tape without a hitch, and proceeded to restore my Hun to its former beauty; the foam had kept its shape just fine.

Off to the field. "This is it," I said to myself. If this thing doesn't survive today, then my buddies are some mean hombres! I threw it out and dived right into the pack - PING! POW! BAM! - just like an episode of Batman - and went home at the end of a full day's combat with an airplane that looked practically AS GOOD AS NEW!!

So, here's Dave's prescription for a tough cookie: EPP foam with a "primer" layer of Ultracote over 3M 77 at the nose area, strategically placed strapping tape over that, then a final layer of Ultracote in the color scheme of your choice over the entire airframe. My Me109 has about 40 flying hours of hard

Tom Ramirez' own design, Lockheed P-38 Lightning, in late war European colors.



on your damage experiences. I covered the plastic tail feathers with film, too, but just laid it over a coat of 3M 77; no heat. The heat didn't hurt the plastic, but it made the film bubble badly. Ultracote Plus may be the hot ticket over the plastic, but I haven't made it that far, yet.

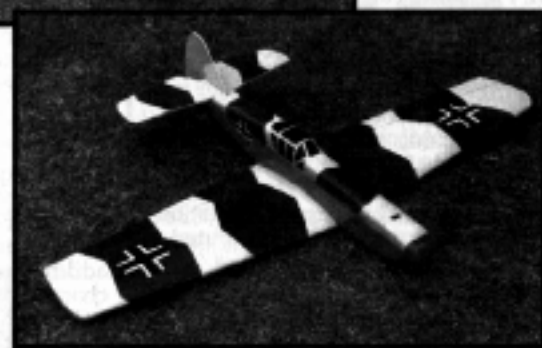
I tested some other combinations, too. I found that strapping tape over 3M 77 held up pretty well in direct exposure to sunlight. This was about the only other thing besides the Ultracote that stayed stuck. Packing



The tape-covered Mustang. You can see where the tape is beginning to lift; not what we want.

The Ultracote covered Messerschmitt. This model still looks as good as new, even after many brutal engagements, including 60 mph closing speed, head-on collisions!

combat and ground smashing aerobatics on it now, and it still looks great. The majority of the wing and aft fuselage are still just one layer of Ultracote over the foam, and they've held up fine; so only use the tape where you need to, based



tape has other problems, as well. It gets brittle and loses its adhesive quickly in exposure to direct sunlight - it's not UV stable. This is another good reason to stay away from it, especially if you're using EPP foam, which will far out-last the tape. I also experimented with 3M 90 adhesive, but didn't see any better results at all; so save your money and "stick" with the cheaper Super 77. (I know, shameless pun.)

Here's what you need to do to find a local supplier of EPP foam. Go to a plastics fabricator and see if they'll let you look at some of their source books, or look under "foam" in the business to business Yellow Pages. It took me about thirty phone calls to find this stuff, but it can be done! You should be able to find a supplier that will sell you less than a truckload, so be persistent and patient. If there's lots of combat fliers at your hill, order a bunch of it and the supplier will be happier to play ball with you.

What became of the baggy Mustang? It's still flying, too, but it looks like the Devil's own spawn. It needs to be kept in the shade when it doesn't have air flowing over its surface to keep it cool, and it gets pretty wrinkly by the middle of the day. You can rub the tape back down to re-stick it, but it's not nearly as pretty as the '109. It still comes out every weekend, though, and still flies fine. Everyone in the club knows they're welcome to take it for a spin and it's serving yeoman duty as a "loaner" to guys who show up without a combat plane at the hill. I still love her even if she ain't so pretty.

So, there's the rap on foam. With this stuff, I think we can come very close to the "Holy Grail" of a bullet-proof AND good looking airplane! Give it a try; you won't be disappointed, and you'll get very long lasting planes, which will ultimately save you lots of money. I'd like to say thanks to John Roe, William Hill and Wade Kloos for their assistance and feedback on testing and procedures - they all duplicated my experimentation to test for consistency and contributed their own experiences, as well.

Reader's Rides

This month, we have Aliso Viejo, California's Tom Ramirez and his self-designed Lockheed P-38 Lightning,

resplendent in chrome Ultracote. The 52" span, 19 oz. beauty rides on a modified Eppler 205 airfoil. The fuselage pod construction is reminiscent of the Bob Martin Talon - a laterally "flattened" hexagon section box with the corners sanded off. The nacelles are of standard box construction, sanded to an elliptical section; the wings are foam core with balsa skin. This is Tom's first venture in design from the ground up, and he says, "For my first effort, I'm more than pleased!" The ailerons are operated by long torque rods that extend to the fuselage where all the radio gear is enclosed. The elevator control cable and housing is inlaid into the wing to take it out to the nacelle, then on to the tail. Tom says this proved tricky at final assembly. He went ahead and installed cable housings in the wing and nacelle, then used a larger piece of tubing to couple them at final assembly. This allowed him to do all his sanding and shaping prior to having everything put together, yet have a positive, kink free setup when final control installation was completed. Tom let me fly this plane myself, and it did real well even in marginal lift. It's very clean and the controls are very crisp, even with the long runs from servo to surfaces. It was tail heavy on first flights, but Tom had the nerve and skill to keep it alive, and bring it to its present, well trimmed, good flying condition. The insignias and canopy trim were all custom cut from iron on film to get good scale proportions. Congratulations, Tom, on a very well done project!

Base Leg

So, that's it, folks. Let me know if you get a chance to play with that foam, and we'll relate the experience here; and of course, keep us posted on your latest projects. See ya'll again next time!

News Flash! Stop Press!

Recent experimentation has shown that SHOE Goo II gives a tenacious bond to the new EPP foam. I was able to obtain some at my local hardware store. In addition to outstanding bonding characteristics, it cures much more quickly than silicone, although an overnight cure is recommended for maximum strength. That said, battle on!

Sailplane Homebuilders Association (SHA)

A Division of the Soaring Society of America



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

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

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A NEWSLETTER FOR F3J ENTHUSIASTS WITH EUROPEAN F3J LEAGUE NEWS

Thermal Talk is an unofficial publication designed to act as a forum to discuss, educate, and exchange information concerning FAI Class F3J. Subscription Rates: £5.00 UK, £8.00 Continental Europe, \$11.00 North America, £8.00 Rest of World.

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September 1996



The Vintage Sailplane Association

Soaring from the past and into the future! The VSA is dedicated to the preservation and flying of vintage and classic sailplanes. Members include modelers, historians, collectors, soaring veterans, and enthusiasts from around the world. Vintage sailplane meets are held each year. VSA publishes the quarterly *BUNGEE CORD* newsletter. Sample issue: \$1.00. Membership is \$15.00 per year. For more information, write to the:

Vintage Sailplane Association

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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.
Ft. Wayne, IN 46835

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R/C Soaring Resources

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

Contacts & Soaring Groups - U.S.A.

Alabama - North Alabama Silent Flyers, Ron Swinehart, 8733 Edgehill Dr. SE, Huntsville, AL 35802; (205) 885-7831.

Alabama - Central Alabama Soaring Society, Ron Richardson (Treas.), 381 Stonebridge Rd., Birmingham, AL 35210; (205) 956-4744, e-mail: lameraf@ix.netcom.com.

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

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

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

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

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

California - Desert Union of Sailplane Thermalists, Buzz Waltz, 3390 Paseo Barbara RD, Palm Springs, CA 92262; (619) 327-1775.

California - Inland Soaring Society, Robert Cavazos, 12901 Forman Ave., Moreno Valley, CA 92553, NCAV8@aol.com.

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

California - South Bay Soaring Society, Dave Burwell, P.O. Box 2012, Sunnyvale, CA 94087; htedoff@ix.netcom.com.

California - Southern Calif. Electric Flyers, John Raley (President), 1375 Logan Ave., Costa Mesa, CA 92626; (714) 641-1776 (D), (714) 962-4961 (E), e-mail: E-Flyer@ix.netcom.com.

California - Torrey Pines Gulls, Ron Scharck, 7319 Olivetas Ave., La Jolla, CA 92037; (619) 454-4900.

Colorado - Rocky Mountain Soaring Assn., Phil Weigle, 1250 Salem St., Aurora, CO 80011; (303) 341-9256 eve.

Eastern Soaring League (VA, MD, DE, PA, NJ, NY, CT, RI, MA), Jack Cash (President), (301) 898-3297, e-mail: BadIdeas@aol.com; Bill Miller (Sec./Treas.), (609) 989-7991, e-mail: JerseyBill@aol.com; Michael Lachowski (Editor), 448 County Rt 579, Milford, NJ 08848, e-mail: mikel@airage.com.

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

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

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

Illinois (Chicago Area) - Silent Order of Aeromodelling by Radio (S.O.A.R.), Jim McIntyre (contact), 23546 W. Fern St., Plainfield, IL 60544-2324; (815) 436-2744. Bill Christian (contact), 1604 N. Chestnut Ave., Arlington Heights, IL 60004; (708) 259-4617.

Illinois (Northwest) - Valley Hawks R/C Soaring Club, Jeff Kennedy (President), 414 Webster St., Algonquin, IL 60102, (708) 658-0755, eve. or msg.

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

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

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

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

Maine - DownEast Soaring Club (New England area), Steve Savoie (Contact), RRA3 Box 569, Gorham, ME 04038; (207) 929-6639. InterNet e-mail: <jim.Armstrong@acombbs.com>.

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

Maryland & Northern Virginia - Capital Area Soaring Association (MD, DC, & Northern VA), Steven Lorentz (Coordinator), 12504 Circle Drive, Rockville, MD 20850; (301) 845-4386.

Michigan - Great Lakes 1.5m R/C Soaring League & "Wings" Flight Achievement Program & Instruction, Ray Hayes, 58030 Cyrenus Lane, Washington, MI 48094; (810) 781-7018.

Minnesota - Minnesota R/C Soaring Society, Tom Rent (Contact), 17540 Kodiak Ave., Lakeville, MN 55044; (612) 435-2792.

Missouri - Independence Soaring Club (Kansas City area, Western Missouri), Edwin Ley (Contact), 12904 E 36 Terrace, Independence, MO 64055; (813) 833-1553, eve.

Missouri - Mississippi Valley Soaring Assoc. (St. Louis area), Ken Trudeau, 3033 Plum Creek Dr., St. Charles, MO 63303; (314) 926-3537.

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

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

Nevada - Las Vegas Soaring Club, Jim Allen (President), 7117 Caprock Cir., Las Vegas, NV 89129; ph (702) 658-2363, fax (702) 658-1998.

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

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

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

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

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

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

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

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

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

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

Ohio - Dayton Area Thermal Soarers (D.A.R.T.S.), Walt Schmol, 3513 Pobst Dr., Kettering, OH 45420, (513) 299-1758.

Ohio - Mid Ohio Soaring Society (MOSS), Hugh Rogers, 888 Kennet Ct., Columbus, OH 43220; (614) 451-5189, e-mail: tomsage@freenet.columbus.oh.us.

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

Oregon - Salem Soaring Society, Al Szymanski, 8991 Edcliff Ct. SE, Aumsville, OR 97325-9549, e-mail: aszy@teleport.com, (503) 585-0461, fax (503) 585-6929.

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

Tennessee - Memphis Area Soaring Society, Bob Sowder, 1610 Saddle Glen Cove, Cordova, TN 38018, (901) 751-7252, FAX (901) 758-1842.

Tennessee - Tullahoma (Southern Middle Area), Coffee Airfoilers, Craig Logan, 147 Stillwood Dr., Manchester, TN 37355, (615) 728-5446, jcllogan@edge.net.

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

Texas - Texas Soaring Conference (Texas, Oklahoma, New Mexico, Louisiana, Arkansas), Gordon Jones, 214 Sunflower Drive, Garland, TX 75041; (214) 271-3334.

Utah - Intermountain Silent Flyers, Bob Harman, (801) 571-6406, "Come Fly With Us!"

Virginia - Appalachian Soaring Association, Virginia's Southwest (Bristol area), Greg Finney, 266 Plumb Alley West, Abingdon, VA 24210; (540) 628-4469 (H), (540) 676-3788 (W), (540) 676-3094 (fax).

Virginia - Tidewater Model Soaring Society, Herk Stokely, (804) 428-8064, herkstok@aol.com.

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

Outside U.S.A.

Australia - Southern Soaring League, Inc. (SSL), Mike O'Reilly, Model Flight, 42 Maple Ave., Keswick SA 5035, Australia. Phones: ISD+(08) 293-3674, ISD+(08) 297-7349, ISD+(018) 082-156 (Mobile). FAX: ISD+(08) 271-0659.

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

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

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

England (Thermal Talk & Europe), Jack Sile (Editor), 21 Bures Close, Stowmarket, Suffolk, IP14 2PL, England; Tele. # 0449-575190.

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

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

Japan - Dr. Paul "Sky Pilot" Clark, 2-35 Suikocho, Hirakata Shi 573, Osaka Fu, Japan; IAC+(81) 720-41-2934, fax: IAC+(81) 6-954-4144, e-mail: 76055.3546@compuserve.com, http://chaos.fullerton.edu/~jcfark/skypilot.

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

BBS/Internet

Internet - Email list/resource of RC soaring related folks, including US and international club contacts, vendors, kit manufacturers/distributors, software, equipment and supplies. Also a resource for aeromodelling related WEBSites on the Internet. Contact Manny Tau at taucom@kaiwan.com, or on CompuServe: 73617.1731.

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

The Frequent Flier's Info. Hot Line, San Francisco Bay Area - Box 1 (lost & found airplanes, helpful tips, upcoming events), Box 2 (questions), Larry Levstik, (415) 924-4490.

THANK-YOU FOR KEEPING YOUR LISTINGS UP TO DATE!!

Schedule of Special Events

Date	Event	Location	Contact
Sept. 13-15	Scale Airtow Meeting	Römlingen, Germany	Local Model Club or Hobby Shop
Sept. 14-15	Airtow Fly-in - Plettenberg, Germany	Plettenberg, Germany	Local Model Club or Hobby Shop
Sept. 14-15	20th Annual NW Championship Soaring Tournament	Tri-Cities, WA	Tom Culmsee, (509) 375-1887
Sept. 14-15	Southern California Scale Glider Festival - Cal. State Dominguez Hills	Carson, CA	Rick Briggs, (310) 433-6327 75754.1422@compuserve.com
Sept. 15	2M Postal Alternate: Sept. 29	Everywhere	Steen Hoej Rasmussen, Denmark (Contact RCSD for forms.)
Sept. 20-22	Last Fling of Summer	Broken Arrow, OK	Dale Nutter, (918) 492-3760
Sept. 21-22	Scale Fun Fly	St. Catharines Ontario, Canada	Gerry Knight, (905) 934-7451 Don Smith, (905) 934-3815
Sept. 21-22	2m, Unl.	Orlando, FL	Hank McDaniel, (407) 831-3688
Sept. 21-22	Fall Thermal Soaring	Tullahoma, TN	Chuck Anderson, (615) 455-6430
Oct. 4-6	Aerotow Fly-In	Pensacola, FL	Asher Carmichael, (334) 626-9141 Rusty Rood, (904) 432-3743
Oct. 6	Fall Fly (Class B-C-D)	Elm Springs, AR	Tom Tapp, (501) 665-2201
Oct. 6	Fall "Intergalactic" RCHLG Championship	Cincinnati, OH	Paul Siegel, (513) 561-6872
Oct. 12	Fall Soaring Tournament	Memphis, TN	Bob Sowder, (901) 751-7252
Oct. 12-13	Fall Soar	Bristol, VA	Greg Finney, (540) 676-3788
Oct. 19-20	CSS STD & UNL (Sanct.)	Cincinnati, OH	Chuck Lohre, (513) 751-3429
Oct. 19-20	2m, Unl.	Williston, FL	Bob Wargo, (813) 938-6582
Nov. 29-1	Tangerine	Orlando, FL	Ed White, (407) 321-1863
June 19-22	1997 MSSC	Huntsville, AL	Ron Swinehart, (205) 883-7831

Reference Material

Still a few copies available of some issues of the printed transcripts of talks given on RC Soaring at the Previous Annual National Sailplane Symposium. Prices reduced to clear out stock. Talks were on thermal meteorology, flying techniques, hand launch, cross country, plane design, airfoil selection, vacuum bagging, plastic coverings, flying wings, etc., etc. Send SASE or call for flyer giving details. Many copies of most recent (1992) transcript left. Clubs have found them good for raffle prizes, gifts, etc. Al Scidmore, 5013 Dorsett Drive, Madison, WI 53711; (608) 271-5500.

Summary of Low-Speed Airfoil Data - Volume 1, Michael Selig wind tunnel testing results. \$25 USA (includes postage), \$29 surface outside USA, \$31 air Western Hemisphere, \$38 air Europe, \$42 air all other countries. Computer disk, ascii text files (no narrative or illustrations), is \$15 in USA; \$16 outside USA. Source for all "ScarTech" publications, also. Contact Herk Stokely, 1504 N. Horseshoe Cir., Virginia Beach, VA 23451. Phone (804) 428-8064, email: herkstok@aol.com.

Seminars & Workshops

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

Classified Note

Please note that the cut-off date for classified & display ads is the 1st of the month.

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In July, Airlife will be publishing *Slingsby Sailplanes* by Martin Simons.

The only complete history and reference to all Slingsby sailplanes, this book describes every Slingsby sailplane and glider from the British Falcon of 1931 to the last motorless aircraft produced - the Vega.

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The Author :

Martin Simons began gliding in 1947 and has been involved with the sport ever since. He has about 1,500 hours soaring time and is still active as a pilot. He has a strong interest in designing, building and flying model aircraft.

After completing national service with the RAF he attended college and university in London and has held a number of teaching posts. In 1968 he emigrated to teach at Adelaide University. From 1970 to 1980 he edited Australian Gliding.

This book will be available from Airlife Publishing from July 1996 priced at £39.95

297 x 210mm, 256 pages, 200 mono half-tones and 80 plans, Carboard, 1 85310 732 8

ORDER FORM

Please send me _____ copy/ies of "*Slingsby Sailplanes*" at £39.95 per copy plus £2.50 postage & packing for single copy orders, £1.00 for two books or more. Europe: £3.00 for one book, £5.00 for two or more books. Overseas surface mail £5.00 per book (Airmail by request).

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Personal ads are run for one month and are then deleted automatically. However, if you have items that might be hard to sell, you may run the ad for two months consecutively.

For Sale - Business

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

PC-Soar Version 3.5 Sailplane Performance Evaluation Program Optional Sailplane Library now expanded to 54 models including: Alcyon, Anthem, Genesis, Makro, Probe, Thermal Eagle, and Synergy-91. Free Library Upgrades. PC-Soar Upgrade to Ver. 3.5 \$10. PC-Soar New Purchase \$40. New Libraries of Sailplanes and Airfoil Polars \$30. Please include \$3 P&H for all purchases & upgrades. Also available: RCSD Database and Laser cut airfoil templates. LJM Associates, 1300 Bay Ridge Rd., Appleton, WI 54915; ph: (414) 731-4848 after 5:30 pm weekdays or on weekends.

PRECISION AMAP WING CUTTER, replacement parts, and service. AMAP Model Products, 2943 Broadway, Oakland, CA 94611. Butch Hollidge, (510) 451-6129, or FAX (510) 834-0349.

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PARACHUTES: \$10. Dale King, 1111 Highridge Drive, Wythe, TX 75098; (214) 475-8093.

Wanted

Set of wings or right wing for Multiplex DG 600. Joe Thomas, (408) 923-3045, California.

For Sale - Personal

F3B Nostalgia, Han Müller "Dohle '82s", 1 V-tail, 1 T-tail... \$1500.00 for pair. Matthias Hanel Modelbau "Spacer" (early roto-wing, glass molded, composite speedster), factory installed canopy speed brake, instructions translated to English... \$600.00. Multiplex "Karo As", 2m glass molded, instructions translated to English... \$300.00; Larry Jolly Model Products "Hinger" HLG... \$35.00; Aerotech "Phoenix" R/C rocket glider... \$100.00; Great Planes "Spectra"... \$70.00; Ted Davey "Lucifer", with motor... \$300.00; C.R. Aircraft "Turbo ST" with both S3021 & S3016 wing kits... \$75.00; plus other fiberglass fuselages and foam wing core short kits. Inquire. All NIB, plus shipping. Bob, (215) 842-6955 (days), (610) 834-1932 (eve. & weekends), EST.

Super-V 110', servos in "V" included, totally wired, just add wing servos and you're done. Asking \$425.00 + shipping. David Brooks, 17 Oak Knoll Road, Williston, VT 95495; (802) 879-6242, anytime.

Sailplane shipping container by Calzone, all fiberglass, two inch foam liner, velcro tie-down straps, locking lid, dark blue, 65" long/12.5" wide/18" high (outside dimensions)... \$175.00 + shipping. Randy Martin, (310) 519-9539, San Pedro, California.

Multiplex DG 300-17, 3.75 or 4.25 meter span, gelcoat glass fuselage, obochi sheeted wings, aerotow release, spoilers, never crashed... \$500.00 bare, or \$600.00 w/6 servos, + shipping. Joe Thomas, (408) 923-3045, California.

Sloggers Skyhawk 116" with original double tapered 7037 wings, painted in mold fiberglass T-tail fuselage with carbon reinforcement, Airtronics 141 flap servos, 341's for ailerons, HS-80-MG in fin for elevator, flown but never crashed... \$400.00 w/servos, or \$300.00 w/o, + shipping. Chuck, (201) 584-3117, New Jersey.

AM/FM computer transmitter only, Airtronics Infinity 600 w/2 RF output modules (one is AM w/ch 40, 45, & 50 crystals; other is FM on ch 45), complete w/2 battery packs, instruction manual... \$200.00 + \$10.00 shipping. Complete Futaba 8UAF flight pack, includes 8 channel micro receiver, 4 ea. S-148 servos, battery pack, charger, hardware, PLUS transmitter module channel 45... \$200.00 includes shipping. Peter Dannenfels, Sr., 600 Riverside Blvd., Sacramento, CA 95831; (916) 427-2490.

Scale: Roke SB-10, 4.84m span, excellent condition... \$900.00; Multiplex Ka-6E, 3.88m span, excellent condition, set up for aerotowing... \$850.00; Pilatus B-4, 3.75m span, excellent condition, set up for aerotowing... \$850.00. 1/4 scale planes include all servos, and have only been flown by a "Little Ole Lady from Pasadena". Bernie Coleman, (704) 846-5219 after 6 pm, or BIRDBERNIE@aol.com.

1/4 Roebbers Pilatus B4, 3.75 meter span (147"), wing profile Ritz 3, NIB... \$495.00; 1/4 Roedel Super Cub (towplane), 2.687 meter span, wing profile Clark Y mod. (suitable motors are 160 T, 300 T, CG BGX-1, Brison 3.2 or similar), NIB... \$385.00; 1/4 Rosenthal Rallye Morane (towplane), 2.78 meter span (109"), NIB... \$495.00; Twin Astir, all glass, 4 meter span, has been flown, hangar rash... \$350.00; 1/5 Wik Twin Astir, all glass, NIB... \$595.00. Contact Robin Lehman, 63 E. 82nd St., New York, NY 10028; (212) 879-1634.

Roedel PSS A-10 Warthog, all styro, 1.7 meters, E205 wing profile, weight ca. 4 lbs... \$100.00. Robin Lehman, 63 E. 82nd St., New York, NY 10028; (212) 879-1634.

Robbe 1/4 scale ASH-26, 4.5 m sailplane, HQ airfoil, features seamless fiberglass fuselage, Obochi sheeted wings/stab/rudder, completely built, full scale cockpit detail, aerotow release mechanism, also set up for winch launch, first place scale trophy winner at 1994 WRAMS Show, featured in January 1994 issue of *Model Airplane News*, excellent flight characteristics, includes aileron servos... \$650.00. Sal Isilli, (516) 922-7432, after 6 pm, EST.

O.S. 300, Gemini Twin 4-cycle engine, excellent power for aerotowing, NIB, never used... \$750.00 (currently selling for \$999.99). Sal Isilli, (516) 922-7432, after 6 pm, EST.

Dart, Cumulus, Paramount 14, large tow plane "Stinson Reliant", Stearman Bi Plane, or trade for large gliders, scale, etc. Gene Molnar, 5362 Aurelia St., Simi Valley, CA 93063; (805) 527-8582.

Wanted

Nelson KA6 glider or parts. Large, wood sailplanes, Baby Eas, Albatross, Minimoa, Comet. Broken or not. Kits or plans for gliders. Synergy, 915E, Samui, ASK-18; or wings and tailfeathers for DG-600. Primary trainer. Hollow core wings, any size. Racers or scale. Hobbie Hawk parts - tailfeathers, left wing, or whatever may be available. Gene Molnar, 5362 Aurelia St., Simi Valley, CA 93063; (805) 527-8582.

NEW PRODUCT

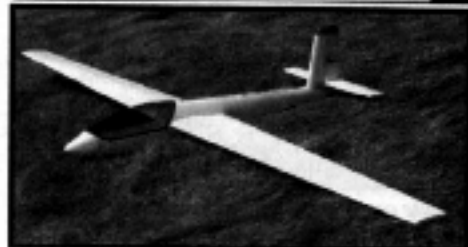
Servo Cars

...from Critter Bits

Ross Models, Inc. of Sparks, Nevada introduces "Servo Cars" for Airtronics® 141 servos. Designed to insert into aircraft wings, the servo can be secured without removing any of the stock mounting tabs. Weighing 11 grams, the circular ABS mounting "Cars" add ease of service to the 141's; once mounted in the wings, the servos can be put in place using the existing, stock mounting tabs. Plug the servo leads into the wiring harness, screw down the lids, and that's it! The "Cars" are available for \$10.00 per set of two. Colors are: white, red, black, and natural, and come poly bagged with hang tags for easy display. Models will soon be available for other servo types. Dealer inquiries welcome. Critter Bits, (800) 375-1312, fax (818) 790-1346. ■

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.



SWIFT S-1 (1.9m)

...from ICARE Sailplanes

This is the latest addition to the kits produced by ICARE (IKARUS) sailplanes. The model is a semi-scale reproduction of the famous Polish aerobatic sailplane that won the 1995 World Championship in France. This model is built to the same high quality standard featured in the IKARUS kits. The S7012 airfoil provides a smooth, fast and versatile flying characteristic. It is fully aerobatic, has a wide speed range, thermals well, races well, etc...

Two micro servos will have to be fitted in the wings; two standard sized servos will be used for the elevator and rudder, which are respectively actuated via a cable pushrod and a kevlar pull-pull. Even a tow release might be fitted in the nose for aerotowing.

The kit comes with a high quality white epoxy fiberglass fuselage. The balsa sheeted and carbon reinforced foam wings are almost ready to cover; no additional work is required on the wings, except installing the wing servo. The tail surfaces are balsa sheeted foam, and need to be finished with leading edge and tip blocks. A smoked plastic canopy and a fiberglass canopy tray are supplied, as well. All wood and hardware is included; fully detailed instructions and building drawings complete the kit.

Specifications:

Wing Span: 75" (1.9 m)
Wing Area: 437 sq. in.
Airfoil: S7012
Weight: 39 oz.
Wing Loading: 12 oz./sq. ft.
Sugg. retail price ARC wing kit: 229.00 US\$ + 15.00 US\$ S+H

Intro. offer: 209.00 US\$ + 15.00 US\$ S+H

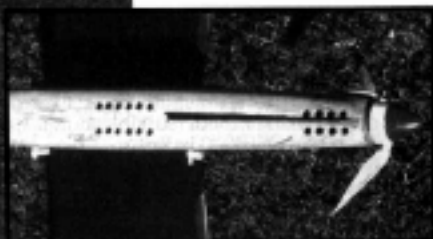
For more info about our products, send your request to: ICARE Sailplanes, Etienne Dorig, 381 Joseph-Huet, Boucherville, Qc, J4B 2C5, Canada; phone (514) 449-9094, fax (514) 449-3497, e-mail <ICARE@telts.com>. ■

An "Electrifying" Experience!

...by Bruce Abell
17 Ferguson Street
Cessnock, NSW 2325
Australia



Note cooling air exit at rear of hatch!



Cooling holes for the motor and batteries in bottom of Electric "Dragonfly"!



Electric "Dragonfly" - Note cooling air inlet above spinner!

My new (?) design, 7 cell, electric powered soarer actually has quite a long pedigree that really starts back around 1987 (see RCSD Vol. 4, No. 7, July 1987), when I recommended some really radical design changes to the wing planform and sections. RCSD, Vol. 4, No. 12 gives the coordinates (hand plotted, only), of the sections used; it shows my first effort at 7 cell electric.

However, I decided to persevere with the "pure" glider for the further development of the design concept, and to concentrate on the 2 meter class.

There were several reasons for this, not the least being the much lower cost and quicker building time of the smaller model. Another was to be able to compare the performance against the bigger and more sophisticated, open class birds.

The 2 meter "Scimitar" proved to be very competitive, and won me quite a few trophies in 2 meter events, but a suggestion by Dr. Ferdinando Galé, to preserve the T.E. planform, while making the L.E. straight from the root to the tip, proved to be a considerable improvement.

This also necessitated a change in the fuselage design, as the C.G. now had to be moved, because the forward sweep brought the aerodynamic "Neutral Point" forward. Thus, the nose had to be lengthened, and the tail moment shortened, in order to get back to something like the aerodynamic layout of the successful "Scimitar"; this new design became the "Dragonfly", as shown in RCSD, Vol. 8, No. 5, May, 1991.

One problem with the new planform

was the lack of response to rudder input when using either the usual, fairly shallow angles on a polyhedral wing, or a straight "V" dihedral wing.

I should have woken up to the reason for this much sooner than I did, but I was in "No-Man's-Land" with this design; I had neglected some of the basics!

Normally, when a model with dihedral is yawed, the angle of attack is increased on the advancing wing, and reduced on the retreating wing; so, the model banks towards the retreating wing. However, another factor comes into play with the forward swept wing, and this is what I think caused the early problem with lack of response to rudder input.

When a model with forward sweep is yawed, the effective lift of the advancing wing is reduced (because of reduced projected area), while the lift of the retreating one is increased; so, the resultant difference in lift negates the effect of the increased angle of attack of the advancing wing. Thus, to overcome this, I had to use the polyhedral layout, with increased tip dihedral; it overcame that problem, but left me with another one!!

This increased tip dihedral moved the C.L.A. (Center of Lateral Area) forward and, with a "conventional" size fin/rudder,

the directional stability suffered. The answer, of course, was to move the C.L.A. back to where it belonged by increasing the area of the fin/rudder.

One of the bonuses of this design is the very distinctive appearance, which makes it easy to identify if there are several other gliders in the same thermal.

At this stage, the design seems to have been developed to its limit, and the model has proved to be very competitive in both open and 2 meter class competitions, winning and placing in many. (Plans for both the "Scimitar" and the "Dragonfly" are available from Cirrus Aviation Ltd.)

Having reached this stage, I decided to build a 120" span version, having previously built a 120" version of the "Scimitar", which I called "Airborne 88 ER"; the 88 ER performed very well, and this is a "full house" bird that has yet to be flown in anger.

Meanwhile, I had bought an "Astro" .05 cobalt motor and gear box; I put this combination in a "conventional", 2 meter span model. Unfortunately, this model proved to be marginal in the power climb, so I got out the burnt stick and piece of bark (pencil and paper!), and drew up a 68" span version of the "Dragonfly" for 7 cell electric; the motor was set up for direct drive on a 9" x 5" prop. The climb is now "electrifying"!

Although I had set up the motor with about 1° of down thrust, this proved to be insufficient, so I increased this to around 3°; this was an improvement, although still insufficient. Rather than increasing the down thrust still further, I decided to utilize an old Free Flight "trick".

A new set of "tailfeathers" was designed, and were built using a 10% thick, flat bottom, lifting section tailplane, with an area of 20% of the wing area. This was intended to push the nose down at the higher speed,

under power, due to the increase in the lift of the tailplane at this higher speed.

The problem was solved!

The model now climbs in an almost vertical L.H. spiral under power, and the extra lift of the tailplane is an added bonus on the glide!

Anyone who has built and flown an electric powered model knows about the problem of dissipating the heat that is generated by the motor and batteries, so I designed a hatch cover that would allow a good flow of air over the motor and battery, with an exit over the top of the wing center section. This proved insufficient for my liking, so I cut a series of holes in the floor of the model under both the motor and battery pack; the cooling now seems to be adequate.

Where next?

I guess the next move is to experiment with turbulator strips and vortex generators in order to see how various types affect the airflow over the upper surface of the wing.

Cirrus Aviation Ltd., P.O. Box 7093, Depot 4, Victoria, B.C. V9B 4Z2, Canada; (604) 478-8144

Also available are plans for R/C Sailplanes - Scale, Sport and Electric. As well as Old Timer, Nostalgia and FF Scale and Sport-powered, rubber and towline. Formerly B-Streamlines plan service, illustrated catalog is available for \$2. "Scimitar" plans cost \$10 US, and "Dragonfly" is \$8 US, post paid, airmail.

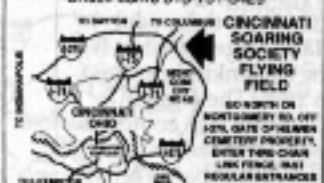


32" span, rubber powered F/F "Cessna C34".

Cincinnati Soaring Society

OCTOBER 19-20

AMA Sanctioned 3 Channel, Standard and Unlimited Sailplane Events. Pilots meeting at 9:30 AM. For more information call Mike O'Donnell 513-729-4757 or Chuck Lohr 513-731-3429



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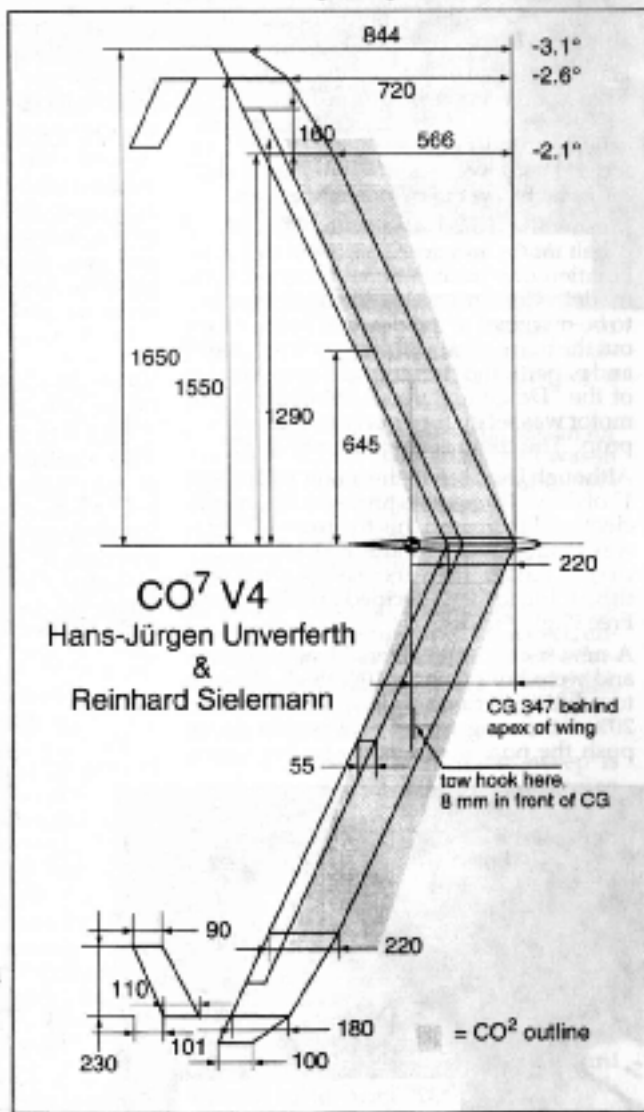
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http://www.halcyon.com/bsquared/

CO⁷ V4

Andrew MacDonald, formerly of Adelaide S.A., Australia, has provided us with an entire package of information about Hans-Jürgen Unverferth's most recent creations — enough for a series of four articles. This month, we'll focus on Hans-Jürgen's CO⁷ (CEOSIEBEN), a high performance swept wing sailplane for the F3B, F3F, and F3J environments. Coordinates and basic aerodynamic data for the three airfoil sections used on CO⁷ will be published in the next issue of RCSD. That will be followed by a description of Joined II, the follow-up model to the Joined I which was described in our April '96 column. A presentation of Hans-Jürgen's thoughts on the potential performance of tailless sailplanes will make the fourth and last installment of the series. And now on to CO⁷!

CO⁷ V4 is the model Hans-Jürgen used to win the Kaltenkirchen Cup in 1995. The annual Kaltenkirchen contest is for tailless sailplanes only, but is based on the

F3B venue and is intensely competitive — a real test of any soaring machine. CO⁷ is a direct descendant of CO², a very successful model which has been kitted and remains very popular in Europe. CO² used a carbon fiber spar, and both Hans-Jürgen and his friend were very impressed with its rigidity. During the first flight of CO², both said "Oh..." and the name C (carbon) CO² (two "oh..."s) came to be. Yes, CO³, CO⁴, CO⁵, and CO⁶ have been built! CO⁷ consists of a moulded composite airframe using fiberglass and carbon fiber.



R/C Soaring Digest

The wing is entirely flat, and is built in three separate pieces which assemble for flying. It differs from CO² in several respects:

- it has a higher aspect ratio, about 16.5 vs. 9.0,
- t has a greater sweep angle, nearly 25 degrees vs. 18 degrees,
- it incorporates a semi-crescent planform while CO² used a simple constant chord wing,
- its winglets are inboard from the wing tip,
- t utilizes a more complex wing twist geometry.

The accompanying diagram shows the CO⁷ planform and relevant dimensions,



Jer's Workbench

Jerry Slaters
P.O. Box 2108
Wylie, TX 75098-2108
(214) 442-3910
RCSDigest@aol.com

Molded Hollow Core Wings Part I

For years now, I have wanted to make a molded, hollow core wing. For some reason or other, I just never got to it, until now.

There are a lot of pros and cons to think about before jumping into a project such as this one. I had to ask myself questions such as, "Do I really want to spend the time and money that a project such as this will require? When the wing molds are done, how many sets of wings will I ever really make? One set? Two sets?" Well, the list goes on and on, with one question after another. And the final question asked was, "If I put this in writing, then will I do it?"

Well, before I talk myself out of doing this project, it is time to simply jump in and give it a try. I'll just have to work out the details as we go along.

First, I am into simple, and do not want a complex, over-engineered mold, especially if it will only be used once or twice. The Factor wing was selected, being the least complex. It has an 83" wing span, an 8" constant chord, and a simple rounded wing tip.

The project began by cutting a set of

including wing twist and locations of the center of gravity and tow hooks. Note the center of gravity is within the aft fuselage. This is an excellent location, as the model is well balanced while being held for winch launching. Also be aware there are two tow hooks, each mounted at identical spots on both wings. A bridle is needed, but launch loads are thus spread relatively evenly across the entire span, rather than being concentrated near the fuselage centerline. Recent information from Hans-Jürgen indicates CO⁷ will soon be commercially available, produced by a fellow in Russia whose experience is in free flight. He should be able to turn out some very light weight, yet strong, models. ■

Spyder foam cores, which were vacuum bagged using 2 layers of 1.4 oz. fiberglass. The balsa tips were added, and then sanded to shape. Pin holes and voids were filled with automotive spot putty; then they were sprayed with two coats of automotive primer.

More sanding is required, and another coat of primer will probably be applied. Then, the wings will be finished with a coat of epoxy paint. Once done, we'll be ready to tackle the lay-up of the wings into the parting trays; then, onto the lay-up of the molds for the hollow core wings.

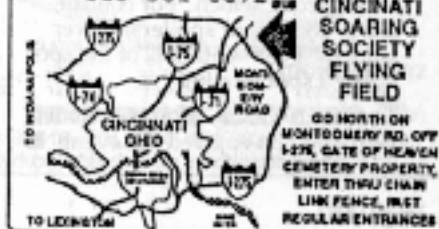
So, back to work. There's a lot to do before next month! ■

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Entry Level Design Contest

...by Jerry Slates
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(The RCSD Entry Level Design (ELD) Contest took place at the '96 MSSC. The purpose of the event was to design a plane that could be built and flown by a beginner with little or no help.)

How much fun can you have for \$76.67? A bunch! And that is exactly what "Tyro" cost.

The winner of the event, Oliver Wilson of Ft. Charlotte, Florida designed, built, and flew his new model, "Tyro", at the ELD event.


His presentation consisted of a 33 page manual detailing how the model is constructed, three sheets of construction drawings, and two sheets of computer generated graphs, which compared his design with two other models: Sagitta 900 and Falcon 880, both ballasted and unballasted. All of the time and effort he put into the "Tyro" proved to make it a winner.

Oliver selected the S-4233 airfoil, which is published in *Soartech 8*. It is a relatively thick airfoil at 13.64%, with 3.26% camber, and uses simple D-tube construction. The wing proved to be very strong. The fuselage was a simple box, with added sheets of 1/4" sheet balsa laminated onto the nose and shaped in such a way that it gave the fuselage a sculptured appearance.

To prove "Tyro's" worth, Oliver did a zoom launch off a winch to show that the D-tube construction would hold up under a heavy foot and a strong winch. For control, using no flaps or spoilers, Oliver landed "Tyro" within 6' of the spot doing a spot landing.

To Oliver Wilson, a job well done! We hope you enjoyed the event! ■

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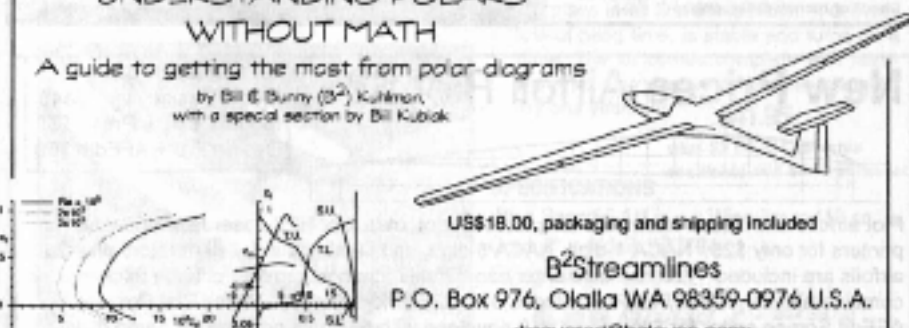
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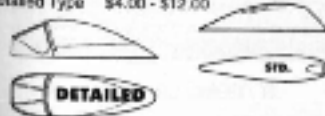
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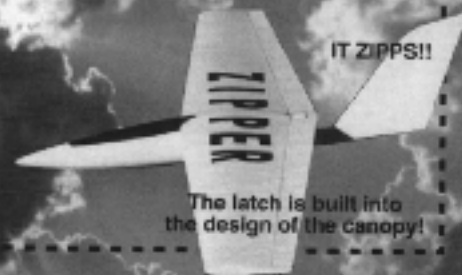


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WING AREA 918 SQ. IN.
AIRFOIL SD7037
WEIGHT 62-66 OZ.
WING LOADING 9.7 - 10.3 OZ./SQ. FT.

The Condor is designed by Mark Allen, who is considered one of the best model sailplane designers in the United States, if not the world. Mark has taken all of his previous experience in competition thermal duration flying, plus all the knowledge he has gained from his earlier contest and sport designs, to design the Condor. Mark Allen's previous planes, to name only a few, are: Falcon 880 and 800, Falcon 600, Swift, Thermal Eagle, Vulcan, Night Hawk, Sky Hawk, Electric Hawk, Falcon 650E, Rocket, Pocket Rocket and, of course, the molded, world championship F3B Eagle. By taking the best of these designs and the new construction techniques available today, Mark has come up with what we feel, is the absolute best open-class sailplane available.

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

CONDOR Tomorrow's Sailplane, Technology Today

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

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

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

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

The Condor, designed by Mark Allen, wings by Ron Vann, fuselage by Steve Hug, and kitted by Slegers International, we feel, is the best open-class, thermal duration sailplane available, at an affordable price of \$195.00 plus S&H.

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