

BARRACUDA

Slegers International is proud to introduce the **Barracuda**, designed and manufactured by **Brian Agnew**.

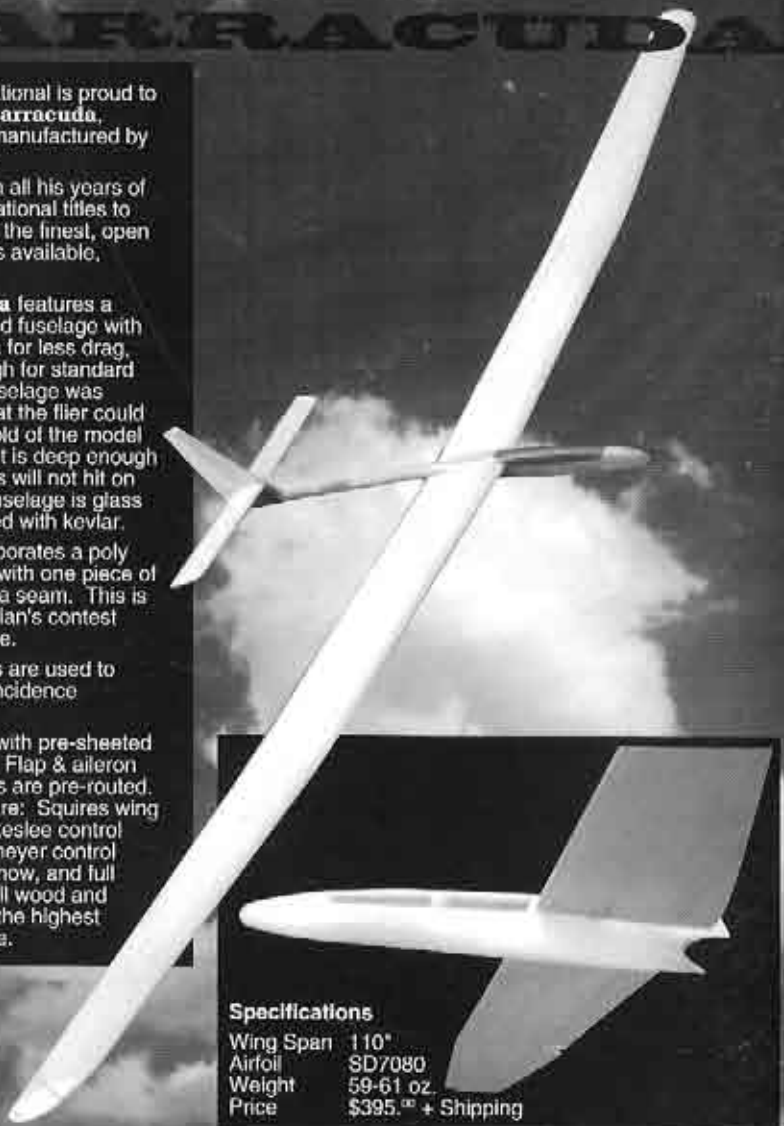
Brian has taken all his years of flying and 15 national titles to produce one of the finest, open class sailplanes available, today.

The **Barracuda** features a unique designed fuselage with low frontal area for less drag, yet large enough for standard servos. The fuselage was designed so that the flier could have a good hold of the model for launching; it is deep enough so that the flaps will not hit on landing. The fuselage is glass and is reinforced with kevlar.

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Airfoil SD7080
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D I G E S T

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TG-3 IN FLIGHT

Photograph taken at the Los Banos Slope Scale SOAR-IN, 1995 by Sean Sharif, San Jose, California.

Lynsel Miller and his scratch built, scale Schweizer TG-3. Photograph by Don Whiteside, Lafayette, California.



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The Soaring Site

A Powered Scale Glider?

We receive notes and letters on occasion that lend a light hearted perspective to the R/C sailplane world. In fact, we always look forward to receiving notes from folks such as Jo Ann and Ernie Barter of Saratoga, California. Usually they include clippings about such things as "The Roadkill Cafe" that are designed to make us laugh out loud. After ROFL (rolling on floor laughing), we try to think of something appropriate to say in response.

Well, one such letter sent in by Ernie and Jo Ann earlier this year, talks about their "powered scale glider". As usual, Ernie's humor in comparing a full-size 707 to the R/C glider world left us ROFL and we thought some of you might get a chuckle, too. While Ernie's letter follows, you might want to glance at the photos on the next page first, before reading further. A picture is, indeed, worth a thousand words!

Ernie says,

"Enclosed find a couple of pictures of my "power scale glider". With the trend towards larger models, we thought you might be interested. Our power scale 707 is in the background of the pix.

"We used to fly this model several times a month, until the co-owner retired both the 707 and the pilot (Ernie). Jo Ann still flies her later versions of this model, such as 747, 1-1011s and 767s.

"While the 707 glider was built of light weight space age materials, it still proved too heavy for them to take it home with them at night, so they let others fly it around the country and even overseas. While enjoying slope soaring and thermal flying, Ernie and Jo Ann would share their fun with a hundred or two others, and take them along with them. This glider could even be flown in the rain, and at night (it had lights), and even in the snow and sleet sometimes.



Jo Ann & Ernie Barter pose with their powered scale glider.



Yep, that's Ernie sitting in the cockpit of his scale "glider".

"The other picture is of Ernie in the cockpit of his glider. Note the realism, most of the gadgets really work. The radio used is on a slightly different frequency than most RCs, but costs about the same. The levers in the center are for the "winch replacement devices" better known as Pratt and Whitney launch engines. While winch and retrievers are much more reliable than the P&W devices, finding winch line and a large enough battery proved difficult. A high-start was out of the question, however the Ex-Navy guys kept pushing for this goofy catapult thing, said it works on a boat, if you can imagine such a stupid idea. A high-start off the front end of a boat? My beautiful 707 model could get wet!

"Other than a few powered high wing cargo gliders (C5, ANs, etc.), we feel that we had one of the largest scale gliders around. If your readers would like to know where they can get such large scale ships, a list

of addresses and phone numbers of builders can be found in the *Aviation Week & Space Technology* magazine. Or a trip to Renton, Washington will do it; be sure to specify color when ordering."

Thanks, Ernie & Jo Ann. We can return your photos, now! What's next? ■

Thermal Fishing

...by Craig Turner
Blacksburg, Virginia

I often wondered why I became so attracted to thermal soaring as opposed to other types of R/C flying. One day, as I was trying to work my Bird of Time into an illusive thermal, it occurred to me. I was struck by the surprising analogy between fishing and soaring. I remember how exciting it was the first time I hooked and landed a fish. I also remember how exciting it was the first time I caught a really big thermal and rode it out until my plane was just a speck in the sky. I then remember the heart thumping excitement of bringing the plane upwind over a row of trees back to the field for a safe landing. I had recently read Chapter Three, "The River of Air", in Dave Thornburg's "Old Buzzard's Soaring Book", and realized that this analogy was not as surprising as you would think. I have been a fisherman for over 50 years, but an R/C soarer for only 5.

In my canoe on the New River in Virginia, I note that the water current is gentle to moderate, but I can only see the surface, and not the fish below. Above the surface, I can feel a gentle breeze or the "River of Air" against my cheek, but I can not see it. An experienced fisherman will note places in the river where the fish are likely to be, such as riffles, jutting vegetation, and deep holes. The experienced soarer also notes areas of the field where a thermal is likely to be, such as over bare areas, paved roads, parking lots, or differences in vegetation. On a given day, the fish may not be where we expect them to be; also, on a given day, the thermals may not be where we expect them to be.

First, in fishing, you must make a nice long cast to place your lure near an area that might have fish. You then have to move the lure around until you find the fish and get a bite. In soaring, you need a nice high launch, and then you work the sailplane around until you find a thermal. Second, once you have found the fish and hooked it, the

trick now is to play the fish carefully. There are many obstructions in the water just waiting to snag your line. Finally, you must land it without losing it and this latter part can be tricky. Many a prize catch has been lost when the fish makes that final desperate flip next to the boat.

Here too, in soaring, once you have found and hooked the thermal, you also have to work into it carefully without losing it. There are also obstructions in the "River of Air", such as downdrafts and other swirls. This takes concentration, and as in fishing, the landing is sometimes the tricky part. Many a perfect landing has been spoiled by that sudden bit of ground turbulence that flicks up a wing into a cartwheel.

In most cases, you cannot see the fish below the water surface, just as you cannot see a thermal. In one case, your reactions depend on the feel of the rod and where the line is in the water. In the other case, your reactions depend on the action of the sailplane and where it is in the "River of Air".

In fishing, you learn how to find, hook, and play a fish. In soaring, you also learn to find, hook, and play a thermal. In fishing, you might go out many times without finding the fish or getting a bite. The same is true in soaring. You may go out many times without finding a thermal. Some days there just aren't any thermals, just as some days the fish aren't biting. Thus, it is easy to understand the fascination of thermal soaring. As in fishing, soaring is never a sure thing. If you caught fish every time you cast a line, you would soon become bored. If you caught a thermal every time you launched your sailplane, it would also become boring.

I'm still at the novice stage of soaring, and I get a thrill out of catching even little thermals or nibbles. However, just as fisherman never die, a friend of mine, a sailplane lifer, still enjoys seeking and riding out thermals. Also, just as in trying to find the perfect fishing lure, I am still trying to find that perfect sailplane. ■

This Old Plane



ZIKA

...by Fred Mallett
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"Texas National Tournament 95"



The '95 Texas National Tournament was hosted by the HOTSS (Heart of Texas Soaring Society) this year. It is a traveling trophy tournament, and is sponsored by one of the Texas clubs

each year. It will be in Dallas hosted by SLNT (Soaring League of North Texas) in '96.

The club had set up the field very well: there were 4 winches laid out, a motor home with power from a building across the street (no generator noise) to run the PC for scoring (via software written by HOTSS club member Moe Draznin), a shaded Tx impound and, most importantly, ice water and sun protection lotion was out on tables around the area. The tarps and awnings were set up in the vicinity of the only trees in the field, and most of



Photos by K.D. White
& Charles Hathaway

Fred Mallett & Esteem
The perpetual trophy for the
Texas National Tournament
(T.N.T.) returns to Texas! Fred
took overall at this yearly, two
day event. ED.



them were shorter than the awnings. There were four landing circles; the landings were all spot landings, 3" per point from 100. Pilots were required to stay outside the circle until after the landing was scored by the timer. I need to practice this type of landing (standing 25 feet away), as I always stand about 2 feet from the 100 point spot. It was not bad, but I had not seen this requirement before. Turns out it was another safety procedure, so that timers and nearby's did not get run over.

The tasks were 3, 5, 7, 9, 11, pilot's choice, on Saturday, and 3 flights - 21 minute add'em up (9 minute max.) on

Sunday. This was nice as only three flights let those who drove a long way (such as from Oklahoma) get on the road early.

Saturday was a perfect soaring day (except for the 9 planes that crashed).



Dale O'Donnell
launching his
Alycone with
Fred Mallett
timing.

Results

Novice Class:

- | | | |
|-------------------|---|------|
| 1) Lee Farris | Original Glass fuse/Spirit like wing (Enough for 8th overall) | 6192 |
| 2) Carl McBurnett | Riser | 5129 |
| 3) Ned Snead | Spectrum | 4843 |

Expert Class:

- | | | |
|-------------------|--------------------------------|------|
| 1) Fred Mallett | Esteem 122 | 6738 |
| 2) Jack Hamilton | Bounty Hunter | 6625 |
| 3) Henry Bostick | Eagle | 6574 |
| 4) Jerry Caldwell | Special Edition w/scratch wing | 6547 |
| 5) Les Akers | Falcon Fuse w/7012 wing | 6445 |

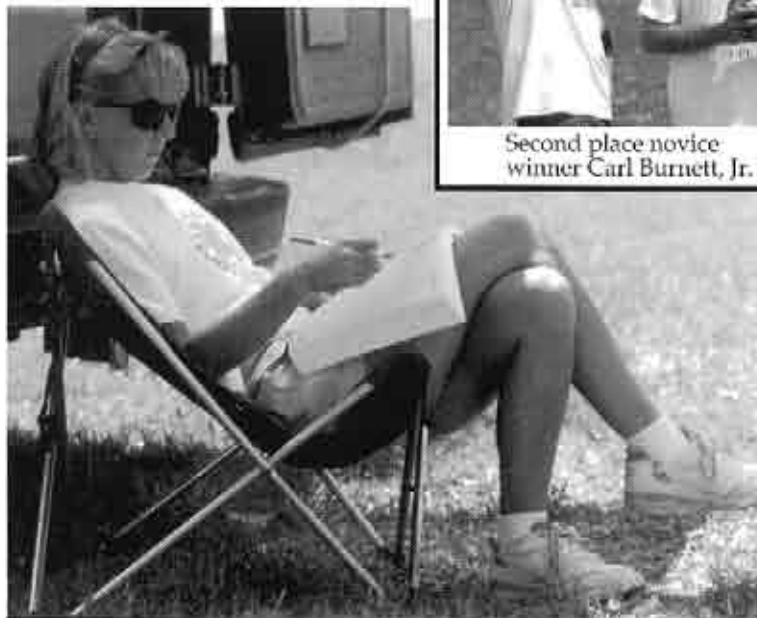
The wind was light and variable with the thermals blowing through. It started with very light lift, which dissipated at about 200 feet, as the day progressed, it turned into sky sized (Texas sized?) thermals, and the corresponding sized sink areas. You had to pick your air to launch in later in the day. As for me, you could say my luck was good. I launched the first flight on Saturday straight into sink, flew the Esteem upwind, and found lift down real low. The Esteem works superb in light lift, and soon I was up to 200 feet where the thermal promptly dissipated. Cruising for another location, I saw a bump;



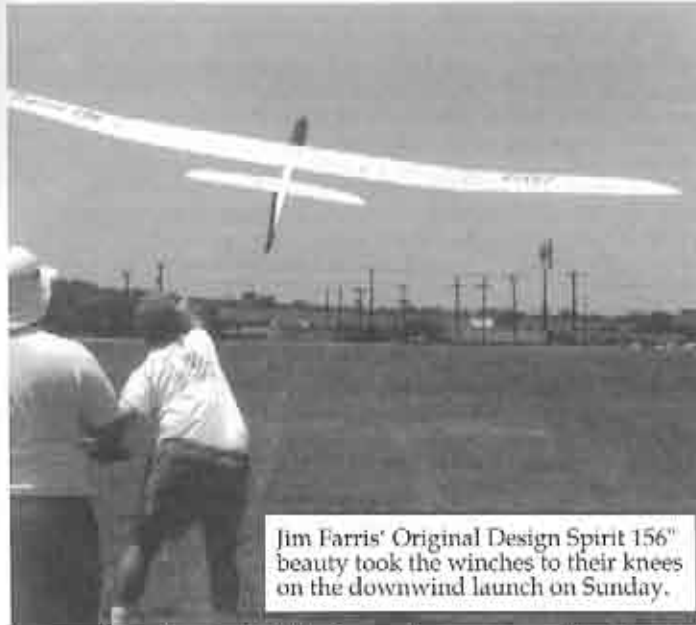
Novice winner Lee Farris



Second place novice winner Carl Burnett, Jr.



Renee Mallett is studying Soartech 8? Uh, oh. Fred's in trouble, now! ED.



Jim Farris' Original Design Spirit 156" beauty took the winches to their knees on the downwind launch on Sunday.

up it went again, but the thermal dissipated as with the first. It took 6 different thermals to get the 11 minutes. That was great fun.

The eventual winner in Novice class (Lee Farris) pulled off an 11 minute first flight working the bubbles extremely smoothly; this young man is one to watch out for. He had the highest score for the day on Sunday.

Then came the round from Hell: Round two.

This contest will be remembered by many for a long time. By my reckoning, over \$3000 worth of airplanes were crashed, and at least 3 of those planes were picked up in plastic bags (foam is not bio-degradable). Almost all the crashes came in the second round on Saturday. Three were due to the "Blue Sky Blues" of losing sight of your plane.

Some of the crashes were a Bounty hunter whose stab fell off on launch (and survived without a scratch), two wings folded on launch, and several did not make it home after a downwind thermal chase. This was also a bad round for winches. Before the contest the club had all the winches rebuilt and restrung. We even had a warm-up contest, and ran 6 rounds with most everyone from the club there to give the winches a workout. Then

came the real contest. Round two, Day 1, TNT 95. A brand new sealed ball bearing turnaround froze. Retriever lines tangled, winch lines broke, a switch stuck. The amazing thing was that even with all these winch problems, there was always at least one winch working, and there were never more than 3 people in line. The winch crew did a great job keeping up with the repairs, and boy

were they busy with 'em. My hat is off to you folks. After that round, and all day Sunday, the winches worked smoothly. Except for having to thread your way through all the people standing around waiting for good air to launch. I guess that is what they mean by sandbagging.

By the end of the day Saturday, things were pretty tight in the score department. The Novice class had Carl Burnett Jr. (another excellent young flier) leading Lee Farris by 77 points, and Expert class had Henry Bostick breathing down my neck by only 12 points.

Sunday dawned clear and calm. Using a little zip start just before the pilots meeting for morning thumb exercises, it was hard to figure which way the air was drifting; it was so calm. The forecast was for south wind changing to north later in the day, 10 mph. During the pilots meeting, it became obviously north, but light; by the time the first flight window opened it was north at 10, by the time the first person launched it was pushing 15, then closing to 20 in gusts, and swinging about 45 degrees. The most fun on Sunday was listening to everyone complain about the decision not to reset the winches for time purposes. HEY PEOPLE!! Everyone was launching downwind!!

What is your beef?? I call it **challenging**, and a good test of piloting skill; and thanks Lloyd, for teaching me that **you need to dial in more flaps to get a good launch downwind.**

There was lots of lift and lots of sink. Combine that with wind, blue sky, and launching downwind (top of the launch, and you are already 300 yards down wind), and you have one challenging soaring day. Far cry from Saturday.

In the first round, forgive me if I got this wrong, but I think it was Tim Bennett that found himself 800 yards downwind and at 100 feet working a small bubble with his yellow Alcione. No way to make it home in that wind from that height. The crowd was watching close as he held altitude for about 3-4 minutes, and eventually the bubble broke free; he worked it to a max time and brought it home to a good landing. Amazing display of skill. There were lots of big sink flights, and quite a few were sub 2 minute times. Very challenging day. After 2 rounds, only 8 pilots had target times (not me).

On the last round, things were very tight in expert class, and any one of 5 pilots could have won it depending on the last flight. As luck would have it (?) we were all in the air at the same time, I think. After 6 minutes or so, I was so far downwind with a fading thermal, the only decision was to bail out and try to come home. Here, is where the value of a great timer comes in. Just to make it home was tough, and a few planes working the same lift never did. At about 500 yards out and descending through 300 feet, I panicked and asked my timer to try to spot some good air to fly toward as minutes were still required, and it was sinky air all around.

Well, good old Dale O'Donnell, my trusty timer, in his Cedar Chopper drawl, says, "Been watchin' some Armadillos back under them Mesquites for a while now." Here I am sinking, like the titanic, and he is talking about critters. I intelligently said, "HUH?"

Dale goes on (always takes some prodding). "They been working up a lovin'. If you think about that some,

you know that's gotta take some work, being Armadillos and all." I begin to make the connection. "OK, where is that Mesquite tree anyway?" He points it out, and I scream over there at about HLG launch height, and sure enough, musta got there at the right moment, as that heating up caused a Halleluia thermal that sucked the Esteem up faster'n an Armadillo gets run over crossing the road; it bought me a max. Thanks, Dale!!

It turns out that the best job of flying, in the tough conditions on Sunday, was by Lee Farris, a Junior flying in Novice class. He had a 1491, and the best "Expert" got a 1481. (Also, nice flying by Jay Schultz.)

And, thanks, to the rest of the HOTSS team that sat out there in the heat and sun and ran the impound, and the scoring, the winches, kept the water coolers full, and brought us lunches. I am looking forward to the 3 day Canyon Lake Classic in October. (Also Sponsored by HOTSS.)

And, yes, Dale. You can borrow the Esteem... ■

Editor's Note

Safety is NO Accident!

We want to thank the members of H.O.T.S.S. for sharing the details on the "Round from Hell"; Fred has written a safety article sharing both his and his club's views on how the unfortunate loss of planes could have been minimized. We all know that safety does indeed come first, although some situations just can't be helped. Hopefully, others may learn from their "Blue Sky Blues" day.

The Canyon Lake Classic is scheduled for October 21 - 22, and Fred says that the Armadillos are considering making the trek, as well. And, if you read the announcement for the event closely, an 86+ pound catfish may be waiting, too!

Sometimes it seems like "Only in Texas" can tall tales come true! ■

OUR GUEST TONIGHT IS "FRED" FROM A LOCAL SOARING CLUB AND HE HAS SPORTS NEWS ABOUT A "ROUND FROM HELL" WHERE A TOTAL OF EIGHT PLANES WENT DOWN! ONE THROUGH A ROOF; THREE FOLDED ON LAUNCH; A GUY GOT LAUNCHED, FELL ON HIS PLANE AND BROKE IT AND... WELL, LET'S HAVE FRED FINISH THE STORY SPORTS FANS!



"Safety Issues" Or, "When is a timer more than a timer?"

...by Fred Mallett
Corpus Christi, Texas

It came to my attention that you can plan a contest with safety issues in mind, and still have dangerous issues arise. This year at the TNT (my first major (2 day) contest), one issue arose that really scared a few of us. Luckily no one was injured. The contest was laid out with landing circles that the pilots and timers had to stay out of during landing, to prevent overrun accidents. The landing area was well marked and far from the impound and spectator area; transmitters were impounded. The safety issue arose from something that you can never control: The pilots and timers. Pilots need help under certain conditions. In the clear blue, cloudless skies of Texas that June 24th weekend, it was rather

difficult to keep your eyes on your plane with no point of reference (clouds) in the sky; look away for a second and three people that day looked back to pick out a different plane. Since they were all thermal turning, everything was happy for a while. By the time these pilots noticed that the plane they were watching was not circling to their stick input, and they wiggled the stick to find their correct plane, it was too late.

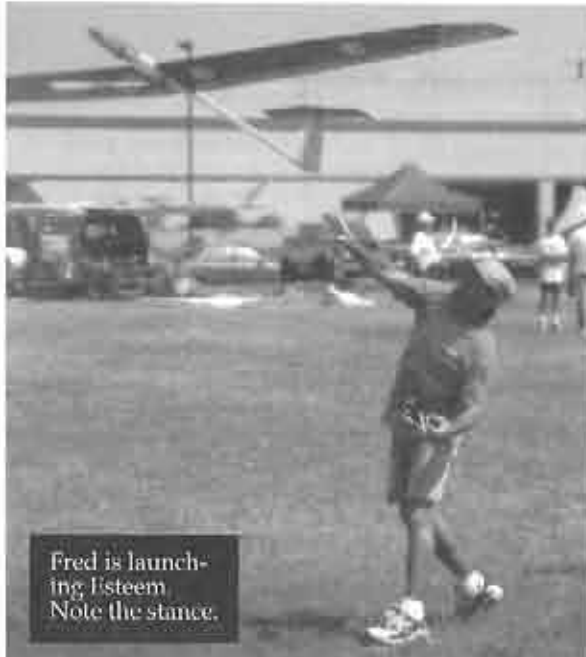
It was raining air-planes!! You would hear a big scream as these open class birds dove from 800 feet. We were blessed though, as all planes landed in "safe" (not for the plane) locations, and no one got hurt. One plane, an Eagle, picked a hardpan lot near the HEB store. Debris and foam dust there; 100

yards away was a parking lot. The pilot was able to recover some working parts from that plane: 1 aileron push rod coupling, and 1 towhook. That was it. That store is a long way from the field; it is amazing how far away a plane can travel.

One plane picked the far end of the field to commit suicide in, and half a dozen people have the briar scratches to prove it.

The third plane was a little bit daring. It picked a nearby housing development. The pilot took a drive through the neighborhood to look for the plane, and a homeowner came out as the pilot slowly cruised by for the 47th time.

The homeowner asked if he was looking for a plane. The pilot said, "Yes," and the homeowner invited him in the house. The pilot figures they were going through to the back yard, but instead was lead to the bedroom where the homeowner points to a bulge in the ceiling!! The Spectrum did



Fred is launching Eiteem. Note the stance.

is the timer's responsibility to see that the pilot never take eyes off the plane by guiding the pilot when it comes time to walk toward the landing area. There are times, when on flat ground, just saying, "Come on over this way," is enough. There are other times, like working through launch lines and around winches, or on uneven ground that I see some problems. Timers!: **GRAB the pilot firmly by the shoulder and GUIDE them!** If the pilot has to look down, or around, you have failed. Then again, some pilots do not trust the timer to guide them safely, and look around even when being guided well. This brings the "team" concept to light. **Get a timer you**

a beeline for the roof, and stuck its nose in, but the wing rod stopped it from going all the way through. The plane was not happy with the abrupt stop, so it detached its nose at the wingrod, and the removable projectile went through an air duct, the insulation, and was barely stopped by the sheet rock. Although perversely amusing, this is dangerous, folks!!!

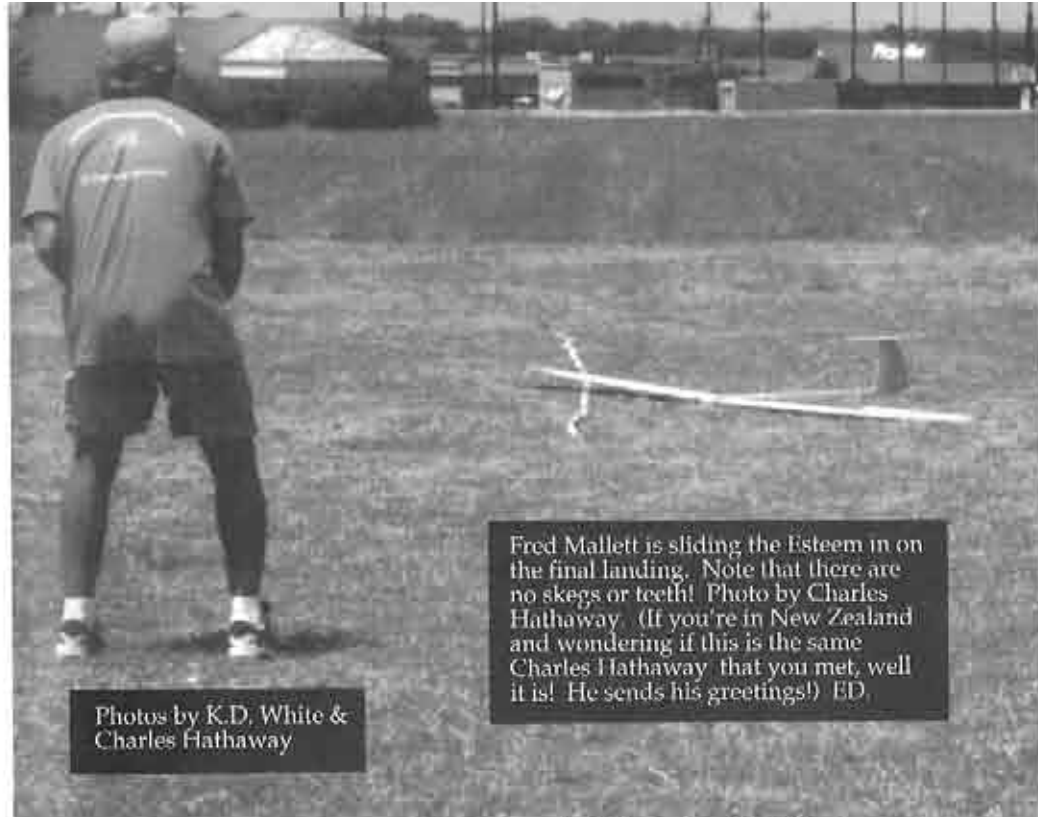
So, who is to blame? Well, if it happened once, I might be tempted to blame pilots. But, think about it; it happened 3 times in one day! To me that means that the conditions were primarily to blame in causing the accidents. **It is difficult to pick out your plane in clear blue skies filled with planes.**

This means to me that we cannot prevent the conditional situation, but need to be aware of it, and work to prevent it. We can try to minimize it by analyzing the timer's job. Don't get me wrong here, the responsibility of flying the plane is the pilot's, and part of that responsibility would include being able to see the plane. So it is up to the pilot to keep the plane within range of "THEIR" vision. **AND!! Never take eyes off the plane.** It

trust, and trust your timer. Communicate. When your plane is in a pack, or high, or far away, or, worse still, all three, (the situation for all three planes mentioned above) is when you pilots must tell your timers



Fred's usual light lift pose. He is struggling for an 11 minute flight in light lift. His trusty timer struggles with him.



Fred Mallett is sliding the Eiteem in on the final landing. Note that there are no skegs or teeth! Photo by Charles Hathaway. (If you're in New Zealand and wondering if this is the same Charles Hathaway that you met, well it is! He sends his greetings!) ED

Photos by K.D. White & Charles Hathaway

to pay attention. Be aware of the situations that can cause visual problems, and tell your timer to start spotting with you. Wiggle the wings and say, "Now," to be sure the timer is spotting your plane, not someone else's; four eyes is way better than two. Your timer should easily recognize, when your plane starts a spiral dive, that something is wrong, and can start screaming madly and gesticulating towards the plane; this can allow the pilot to recover before disaster. I get bothered when I see someone timing for a pilot, and standing there conversing with others while the pilot is flying the plane alone. You are a team. If not for success, you must be for safety.

While in Atlanta, Georgia this week, I stopped in at Finney's Hobbies where there is always a sailplane wing going in, or coming out of the bag, back in the building area of the shop. While there, Trey told me of another reason not to ever take your eyes off the plane. Seems that during some fun flying at

the Mid-South, a HLG flier turned to someone else while coming in on approach, and looked back to get his own plane square in the forehead. Stitches were required.

And, for my last beef, I think that people are wrong to complain about down wind winch launches. So what. Learn to do it. Many places have fixed winches, and I personally am there to fly, not run around and help (or worse still, sit and watch) winches be re-set. BUT, contest directors, you owe it to safety to put cones out down wind of the landing area, and require planes to come though them to prevent the "planes from every direction" thing that happens when there is no required direction. **Downwind landings are dangerous.** Sure, when the wind is light and variable, nothing can be done, but when the wind changes consistently, change the required landing direction.

So, in summary, there are safety procedures that a Contest Director can put in place that are very good and can

prevent issues. But, some rules need to be established between pilot and timer to help with the situations that Contest Directors have no control over.

The key to that is communication between pilot and timer. Also, having a good timer you trust, and have been teaming with for a long time, helps. (Dale, are you going to the Canyon Lake Classic in October?? Wanna time for me?) If not, it is up to the pilot to tell the timer what they expect. Better before hand, but during a flight is OK, also. The last flight on the second day of the TNT this year I needed a max, badly. I flew a bit higher and further away than I usually do, and was having trouble with orientation. I'm surprised Dale didn't smack me up side the head during the early part of that flight as I repeated every 15 seconds, "Keep watching it. Man, I'm not seeing the plane, well. Keep your eyes on it. Can you see it? Keep watching for me. Help me with visuals," etc., etc., etc., 'til it was back in good vision range (for me). I never should have let it get that far away.

Another possible safety issue can be cleared up with the timer's responsibilities at launch time. We had a bad co-incident at TNT that could have been a personal injury, but luckily it only broke a plane. How many of you walk up to a winch (especially if it is the first flight in the round), grab the ring, put it on the hook, get to the foot switch and tap it to "clear and straighten" the tow line? Sound pretty normal? I see it all the time; I do it myself. Well, at this contest one pilot did just that. He stepped up to the winch, and hooked up. The line was crossed over the retriever line, so he tapped the pedal quickly to get the line straight. God decides it was time for some humor. The switch sticks. The pilot was not ready for any pressure, but thinks quickly (that was the mistake, I think), and decides to lift the nose of the plane to let the tow ring slide off. Well, with the TX in one hand, and the plane in the other, feet not braced like when in launch stance, it was the winch that won. The pilot took a big dive with equipment in

Some Simple Safety Rules

- 1) Timer guides pilot firmly when near obstacles. It is easier to walk trustingly when in physical contact, than just by listening to an "over this way command".
- 2) Timer helps pilot spot plane when not moving the pilot
 - a) From the winch area.
 - b) To the landing area.During a and b the plane is usually not hard to spot.
- 3) Timer helps with tow line hookup, line straightening, and initial winch tap.
- 4) Pilot tells timer what they expect.

hand, and landed on the plane. Scratch another nice plane. This can be avoided by **having the timer get the tow ring**. The pilot has hands full with radio and plane, so why not work a sequence where the timer holds the ring safely in hand so that it can be released (no fingers through the ring), and stands in front of the switch and pilot. On command (from the timer), the pilot taps the winch to straighten the line, which also gives the switch a quick test to ensure that it will release (of course it could stick next time); if it sticks, the timer just lets go. Then, the timer puts the ring on the hook, and the pilot is in position and ready for the final taps to tension the line, and load the line for launch.

Oh, and the other great part of a good timer is **helping to spot lift, and other planes in the landing pattern**, so you do not try to land in the same circle. (I blew this one and robbed another pilot of a landing by letting my pilot take his circle.) That same last flight, I was in big sink coming home fast, and did not dare to look around. So, I asked Dale to look around for some good air, and he steered me right into a Halleluia thermal at about 75 feet elevation to let me grab the three more minutes needed to max. Thanks, Dale! ■

In Tribute to the Spin

Rick Eckel
Winter Springs, Florida

It happened again last weekend. Not that it's all that uncommon, mind you. It's just that it's such a helpless feeling when there is nothing you can do but watch. You know what the end result will be, but you stand there and just watch. Or maybe you shout some kind of instruction - but it's useless. There's nothing to be done but wait for the inevitable. And the inevitable always comes and it's a pile of rubble on the ground. Another crashed model airplane.

Broken wing? No. Radio interference? No. Poor piloting skill? No. None of these are involved in the most frustrating of all crashes. It's simply a loss of visual contact with the model by the pilot. Other fliers can see the model perfectly well. But they are unable to help because even shouted instructions cannot replace the visual reference the pilot has lost.

Losing sight of a model is not all that difficult to do. It can happen when the

model flies across the sun, particularly difficult if it happens during the launch. It happens when the model goes into a low lying cloud, or when it is simply too high or far away for the pilot to see. It can also happen in a moment of pilot inattention. One glance at a distraction and the plane is gone.

The question is, "What do you do if you lose sight of your model?" I for one resort to the spin. The simple spin has a variety of useful attributes. It's easy (with most models) to do. You don't need to be able to see your model to perform a perfect spin. It doesn't over stress the model. The spin is a 1G maneuver, and applies no more stress to the airframe than flying straight and level. It makes the plane easily visible. The movement of a plane in a spin is very attention getting, and it instantly identifies it as the lost craft. (Unless everybody else is in a spin also!) While in a spin, the relative position of the plane changes very little. Just a little drift with the wind. And it ensures that the plane isn't nose diving into the ground, but instead is making a relatively slow descent.

None of the attributes of the spin will guarantee that the loss of visual contact with your airplane will not result in a crash. But they certainly go a long way to helping recover contact with the plane. Or, if nothing else, you will have a real good idea where to start searching for the wreckage!

Next time you go flying, practice the spin. Hold full up elevator and full left or right rudder and your plane should spin in place while slowly losing altitude, much like a falling leaf. Be careful that a spiral dive doesn't develop. To recover from the spin, ease off the rudder and then the elevator. Practice your spin frequently and don't hesitate to use it if you lose sight of your model! ■



ZIKA

THREE PEAS IN A POD



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Skill, Talent, Equipment, Timer, or Attitude?

Curt: I seem to spend a lot of time in my 4-Runner, mostly commuting to work. In California, that usually means sitting on the freeway in bumper to bumper traffic. It takes me about an hour each way to cover one half of the fifty mile trek. Oh sure, I could speed things up a bit if I belonged to a car pool and used the less congested diamond lane, but I like riding by myself. You see, the diamond lane requires at least two occupants in the vehicle. If you're caught by the Highway Patrol as the only occupant, the minimum fine is \$271. A few years ago, a pregnant woman beat the wrap by claiming her baby was a passenger. People have been reported using mannequins or even pretended to be spanking a non-existent kid in the back seat when the red flashing lights glared through the rear window. My brother used to dress-up a large stuffed bear and put it in the front passenger seat with a Cubs baseball cap. He never got caught. I'd probably end up in jail.

Different things work for different people, and successes usually come when we find the right combination. About a week ago at our local club contest, Paul virtually flew four near-perfect rounds of a mandatory 4-8-8-4 format CD'd by Mike. He finished well-ahead of the pack as over-all

points leader. Paul was flying his new Super V two meter, while I timed for him. He said it was the best he had ever flown. Afterwards, we usually hang-out at Paul's shop (California Soaring Products) because we store the contest equipment there and he keeps the doors open for a few hours on Sunday. We briefly discussed what combination put him in the winner's circle. Monday morning, in traffic, I realized that we had our next column. Really, how much does equipment, skill or talent, and your timer have to do with winning? Here's a few of our thoughts.

Mike: We all realize that the above mentioned elements: equipment, skill, talent and your timer, play key roles in your contest performance. I also believe attitude is very important. Let's take Paul's contest performance as an example.

Paul has not been flying his Super V very long, but I have heard him say how well it slows down for those pin-point lands and how high it launches. The Super V is light weight, has an excellent airfoil and performs very well in light lift. He is not being hand-capped by his equipment. Sure, Paul with the aid of his timer, must find lift and work it long enough to get the flight time and then make a good

landing, but just think about his attitude when he steps up to the winch. His mind isn't cluttered with negative thoughts about not having enough time in the air to find lift nor how much of a problem it will be making that pin-point landing! He's reading the air for clues to thermals and determining the best search pattern.

After the zoom, he will be flying that search pattern and listening to his timer about conditions in other parts of the sky. This is where a good timer really comes into play. Even after lift has been found, the timer should be keeping the pilot informed of what is happening in other locations. Lift may rapidly deteriorate, and a new plan of action, quickly formulated and placed into action, may be required. Some timers I've used, just watch the clock and comment on how I'm doing at my present location in the sky and don't keep me abreast of conditions outside of my current location. Even if his Super V gets low, Paul believes he is flying a superior plane, has the talent and skills required, the right attitude and therefore, lift is just a moment away. Only when the lack of altitude might jeopardize making it back to the field and a good landing, does he give up on his current search pattern and head for home. Lift can still be encountered, so Paul and his timer will be thinking thermal until he enters his landing pattern.

Obviously, Paul must have enough skill and talent to launch, fly where he and his timer think he has the best chances of finding lift, keep the plane in lift long enough to get the required time and make a good landing. I'm talking about what it takes to move up into the upper levels of this sport. Skill and talent played significant roles when Paul was learning the basics of R/C soaring and how fast he was able to pick up on new techniques and progress towards the top of the heap. Even at this level, there is quite a spread of performers at any contest. Those most likely to be at the top, have the proper attitude. They are not *hoping* to do well, but *know* they will do well! They may not win, but will always be pushing the leaders.

And don't forget, your score is not

always the best indicator of just how well you did. During a called flight order type contest, you may have encountered some very marginal conditions during one or more rounds, but were able to maximize your performance to the limits. Under these conditions, your attitude is not being lowered, it is being reinforced and will serve you well at the next contest.

Paul: I had crashed my only plane three months ago and had to borrow an old Falcon 880 from Curt Nehring to fly in the Pasadena two day contest. On the second day of the contest, I put that plane into a tree at the end of the field.

Thanks to Mark Levoe, I had a used Super V wing at my shop for sale. I contacted Mark and he was able to get a fuselage with the V tail for me. We assembled the plane and programmed my radio. I thought the first flights on the plane were great.

The following Saturday at our field, Phil "Sparky" Halford and I were talking about Super V's and I asked him to fly mine. He launched it, and after flying for awhile, said there were problems! He asked me if he could play with the programming. He proceeded to "do his thing". Phil then relaunched it and proceeded to do aileron rolls and the like, all around the field. He then told me to fly it.

I flew it and what a difference! In the past, when I flew a new plane, I would hand launch it and then winch it up. I would adjust flap compensation to get the ballooning out of it and make sure it would turn. I would end up with a basic set up and leave well enough alone. I would never experiment. That's just the way I flew, but thanks to Phil, he taught me how a sailplane should react. What he taught me was all gained from experience. Phil has flown Super V's for years.

At our next contest, low and behold, I found out that I could fly that sailplane. I launched for the third round and caught a thermal. However, Murphy's Law showed its ugly hand. Wouldn't you know, the bottom blew out! There I was at 150 feet, two minutes into an eight minute round. Curt was my timer. He talked me into flying to the end of the field, where I

found a small "bubble". Nervous and shaking like a leaf in a windstorm, I started circling and circling. It seemed like a year that I was circling and drifting, circling and drifting, all the time feeling depressed and upset about my luck. I never in my life made such flat and level turns. Curt then advised me to go to the landing area. After asking, "Why?" he let me know I had one minute to go.

That showed me how important your equipment is. A sailplane that is properly set up and a radio that you can be comfortable with really does count. It also taught me that asking questions and having help from people is definitely an added plus. Choose a sailplane and airfoil you think you can fly. Don't go over your head. A good airfoil and proper set up will work all the time. Practice, practice and more practice will give you confidence to fly your plane well.

In the last five weeks, I have learned a lot. I thought I knew it all about my past planes. Boy, was I out in left field. Having a good timer and listening to him while you are flying is also very important.

(P.S. Cornfed, that tree was only 50 feet high, I can't outdo you on that one!)

Curt: One of my friends won Visalia a couple of years ago after flying a flawless final round. His girlfriend at the time, was extremely upset with him just prior to launching. She had been his timer all weekend, but for his last flight he chose a fellow teammate and experienced competition pilot. The points necessary to finish well became a critical concern. Although his girlfriend probably just wanted to be a part of his victory, to share a memorable moment, she lacked the "edge" he needed that only a seasoned timer could provide.

Over the years, many articles have been written, some in explicit detail, concerning the so-called "duties" of an efficient stopwatch operator, but I don't intend to go into a step-by-step guide since most of it is fairly obvious. We all know, for instance, that it helps to have a working stop watch you're familiar with and a pen or pencil in hand. A timer also commonly picks up

his pilot's frequency pin and scorecard prior to launch, will fetch the towline and usually ask for a control surface wiggle before the flyer steps on the pedal. Then all he has to do is start the watch when the flag or chute drops away from the glider, find the pilot a safe walking area to the landing tape and stop the watch when any part of the plane touches the ground. Right? Well, not exactly.

For any given round, your timer is also your teammate, somewhat of a co-pilot. That's why it's important to be selective and not just settle for "anyone that's available". It's not realistic to think that you'll have the same person for 3 or 4 rounds, but it is possible to build a working relationship with a couple of different people that you feel comfortable with and consider skillful in competition.

I rely heavily on a few friends that have eagle eyes, a considerable history of contest flying or just a knack for spotting lift when I'm in the tunnel-vision mode. All of them remain very calm under pressure, keeping me posted as to the time remaining in the flight. They are also accustomed to the type of countdown I regularly use and set the landing tape in the direction I feel is most comfortable at that moment. An experienced timer will usually avoid trying to "fly your flight", but may mention cross wind approaches, downwind finals or anything else that he thinks may ultimately effect your normal pattern prior to touchdown. If you're landing early, count on a good timer to exercise the non-written "right of way" rule which usually bumps another pilot from the tape that has more time left on the watch than you do.

In closing, I believe that a good timer is not just an extra set of eyes, but an integral part of any contest pilot's overall performance. Each flight should be a team effort. If it isn't, find another timer, and do it before the next round. If you're a sportsman or novice, ask an expert flyer to time for you. Take advantage of his knowledge and contest experience. If you don't, someone else will!

Three Peas in a Pod will be back next month. Until then "Boomers!" ■



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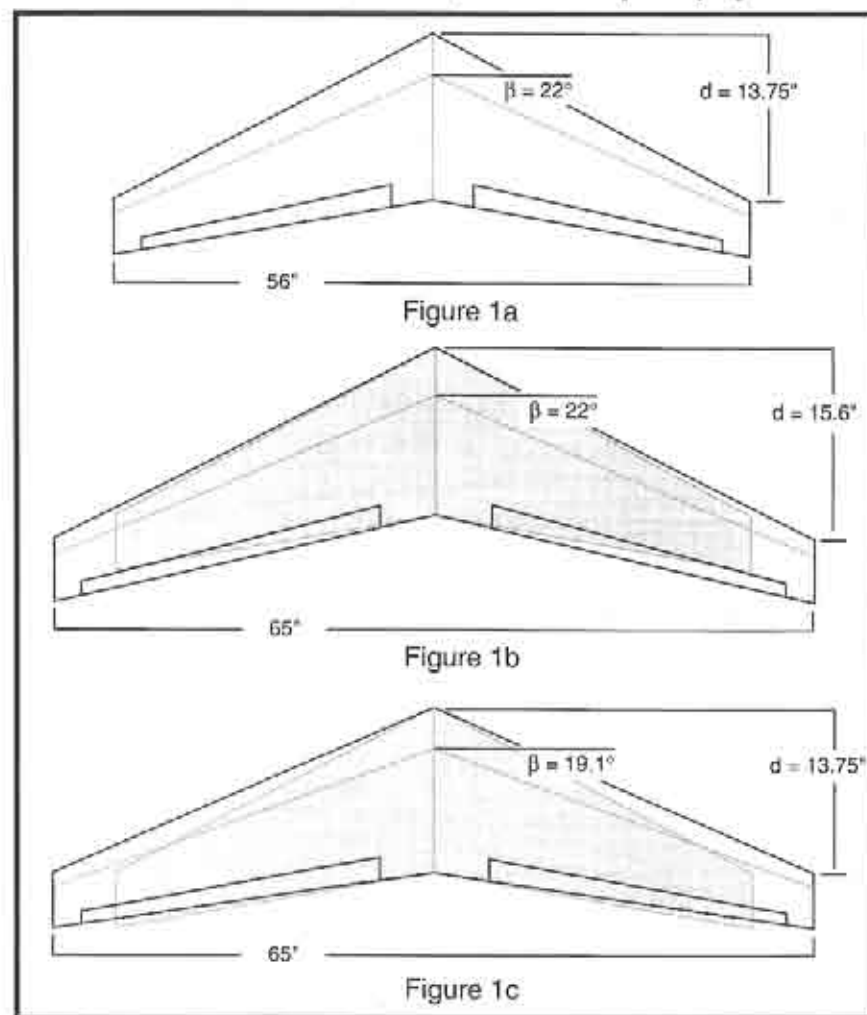
Modifying the Quality Fiberglass Javelin

Earlier this year we had a chance to talk to Steve Savoie of Gorham, Maine.

Steve had constructed a Javelin and was very pleased with its performance, despite a relatively high wing loading brought on by "overstrengthening".

The Javelin is a true flying wing which is extremely easy to build. Balsa sheeted foam core wings and solid balsa elevons promote rapid construction of the basic airframe, while installation of radio gear entails only some hatch cutting and a bit of foam removal.

Several members of the DownEast Soaring Club, Steve's flying group, expressed interest in modifying the Javelin for the specific purpose of



improving its performance on the slope, and Steve contacted us for advice. Here are a couple of questions which Steve relayed to us.

Carl Trotter: "Since the wing has no twist (washout) and is designed to fly in level flight with the elevons reflexed $1/8^\circ$, can I transpose the reflex into washout and fly on the slope without reflexing the elevons and thereby producing less drag with a cleaner wing?"

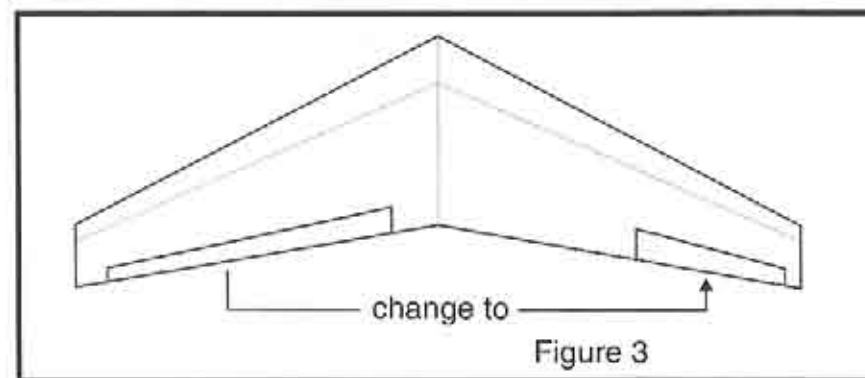
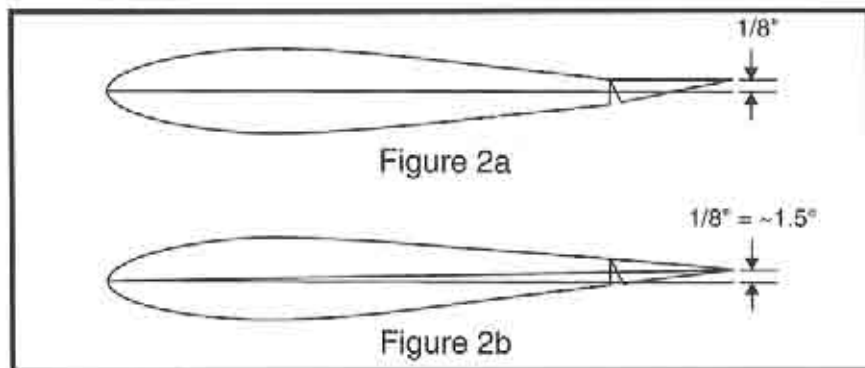
The Javelin planform, depicted in Figure 1a, incorporates several features designed to make construction easy and set-up simple, but there are necessary compromises in other areas.

The Javelin's elevon reflex produces a down force which provides the positive pitching moment necessary for stability, but does so across nearly the entire span. Reflexing the root airfoil is not necessary and is probably detrimental to overall performance. The Javelin's quarter chord line is swept back 22 degrees, so twisting the wing

(washout) would be more efficient.

Figure 2a shows the original geometry of the Javelin wing at the end of the elevon; Figure 2b shows the same section's geometry when the elevon trim is replaced by an equivalent amount of wing twist. The twist value works out to be very close to 1.5 degrees, as noted on the drawing. This is a reasonable amount of wing twist, and could be easily incorporated into the wing during construction, particularly if custom cores were made. The Panknin formulae indicate this is the amount of twist used for a design C_L of 0.25 with a static margin of 0.02; these are average values for a responsive aircraft designed for slope flying.

The original Javelin uses a symmetrical section without twist, so inverted flight is simply a matter of reversing elevon trim. Exchanging wing twist for elevon trim makes sustained inverted flight more difficult, as the required down elevon trim will be significantly



Span	AR	Sweep Angle, β	Area	Wing Loading*	Airfoil	Req'd Twist†
56"	5.6	22	560	7.5 oz/ft ²	Symmetrical	-1.38°
					EH 1.0/9.0	-1.24°
					EH 2.0/10.0	-1.19°
65"	6.5	22	650	6.4 oz/ft ²	Symmetrical	-1.12°
					EH 1.0/9.0	-1.00°
					EH 2.0/10.0	-0.96°
65"	6.5	19.1	650	6.4 oz/ft ²	Symmetrical	-1.29°
					EH 1.0/9.0	-1.16°
					EH 2.0/10.0	-1.11°

* based on a total flying weight of 29 ounces
 † based on a design C_L of 0.25 and a stability factor (static margin) of 0.02

greater. Using twist instead of elevon reflex may reduce overall drag in normal flight, but there will be a substantial increase in drag during sustained inverted flight.

Walter Mudget: "Can I keep the original 15" root and 5" tip chords and increase the wingspan from 56" to 65"?"

Adding a few inches to the Javelin's span increases the aspect ratio, and the larger size will make it easier to see. There are two ways of increasing the wing span: keep the sweep angle, β , constant as shown in Figure 1b, or keep the sweep distance, d , constant as shown in Figure 1c. As can be seen in the accompanying Table, the wing twist values remain very close to that established for the original 56" span, regardless of which of the two methods is used to increase the wingspan.

Here are some other possible modifications which can improve the Javelin's performance:

- As we said earlier, the size and location of the elevons could be improved. Their span should be reduced and chord enlarged, and the area concentrated in the outboard portions of the wing panels. See Figure 3.
- For those interested in flying the Javelin in light lift, a measurable increase in performance can be obtained through the use of a cam-

bered wing section. We chose two of the EH series of airfoils for inclusion in the Table. The EH sections have low drag values and extremely low pitching moments, yet are capable of very high lift. These attributes make them very attractive choices.

- The Javelin's airfoil is almost 12.5% thick. While this gives a large amount of room for radio gear, using a thinner wing section will cut drag and produce a slightly lighter airframe. A section with 7.0% thickness, for example, provides over an inch of height at the Javelin's 15 inch root. There is sufficient volume for one of the new slim-line receivers and a flat battery pack; and the outer portions of the wing remain thick enough to house small servos for direct drive to the elevons. Coordinates for thinned renditions of any section can be obtained quite easily with some of the available airfoil plotting programs. This opens some intriguing possibilities for those interested in 60" slope racing.

The Javelin planform provides a good basis for experimentation, and readers interested in making modifications for improved performance have several options open to them in addition to those mentioned above.

If you have a topic you'd like to see discussed in a future "On the 'Wing..." column, let us know! ■



ZIKA

Everyone Has a Full House or Hand-Launch Topics

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AOL/Internet Surfing

I've acquired a new Power Macintosh/IBM compatible hybrid computer. Along with it I bought a 14.4K modem. So I've hooked into AOL and the Internet. It took me only a little while to hook into soaring@airage.com, an Internet forum for radio-control sailplane hobbyists. Some of the material for this column will come from the mail circulating on soaring@airage.com.

I've also hooked into Dr. Selig's World Wide Web site and downloaded some airfoil coordinates. He and his graduate students at the Urbana campus have done a great job of presenting and organizing their information.

Although I've made software engineering my career for many years, this is the first time I've "surfed" the Internet. It's awesome.

For those of you who are on AOL, my E-mail address is "scottrchlg". For those of you on the Internet, that's scottrchlg@aol.com. I answer all mail and E-mail; I'd appreciate hearing from all of you.

Film on Foam

Mark Gumprecht of the Torrey Pines Gulls brought a new homebrew glider (aileron, what else?) to the July 1 HL contest. The glider has a meticulous covering job in orange and white; it is gorgeous.

Listen up you who want to build foam wings but don't have access

to a vacuum bagging setup:

I asked Mark how he did it; he said it was simply Econokote directly over pink foam (1.5 lb/ft cubed). On a low iron temperature, the foam doesn't melt. He figures his wing competes with any wing construction technique for lightness.

He installed a balsa spar with carbon fiber caps to maintain stiffness. The plane flies great; Mark says he doesn't notice any problems with torsional flimsiness in the wing.

The ailerons are built-up. Mark gained stiffness and "bendability" by installing a 3/32" OD aluminum tube through the length of the aileron. The tube installed into "sockets" on both ends; the resulting pivot is the hinge as well.

A Great HL Contest Scoring Program

Don Richmond, also of TPG, brought his computer, PA system, and gas generator for the most advanced contest scoring program I have ever seen. The program managed all rounds by announcing in Don's voice the times. Scores were available for a heat within minutes.

This program was written for DOS, but a new program will be implemented in Borland Delphi for Windows. I work with Delphi also; it is a GREAT development tool and so, Don, I expect GREAT things in the next program. Like, I expect it to tell me where the thermals are, okay?

Don is planning to make the program commercially available.

World Wide Web Addresses

For those of you who want to look around at R/C WWW sites, Lacroix Marc submitted these on soaring@airage.com:

<http://uxh.cso.uiuc.edu/~selig/> UIUC-M Selig homepage

<http://www.grfn.org/~kent/rc.html> R/C Helpsoft

http://alpha.smi.med.pitt.edu:9000/RC_ONLINE/Rc_Online.html R/C-Online magazine

http://www2.primenet.com/~bhenley/R/C_Central

http://www.best.com/~anabat/Aerotech_home_page

<http://techreports.larc.nasa.gov/cgi-bin/NTRS> <http://techreports.larc.nasa.gov/cgi-bin/NTRS> (whatever that means!)

<http://rampages.onramp.net/~micheleb/hanger.html> Michele's Virtual Hanger

<http://www.cudenver.edu/~ltrujiil/RC/rc.html> The R/C Soaring page from Hardwired aka Lee Trujillo

http://www.paranoid.com/~filipg/HTML/RC/Fils_RC.html Fil's R/C Model Info

<http://www.mat.uc.pt/~pedro/ncientificos/Aeromodelismo.html> Aeromodelismo

<http://www.prairienet.org/business/tower/tower.html> Tower Hobbies

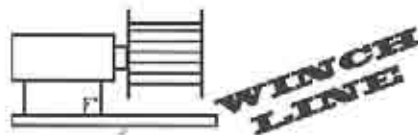
<http://www.rbdc.com/> King R/C (perhaps ip-dead 'Rip')

<http://www.harrier.com/rc.html> R/C Model Info 2

<http://world.std.com/~racores/> R A Cores

<http://www.ace-hobbies.com> ACE-hobbies

<http://www.peinet.pe.ca/ECMC/> ECMC ■



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New Selig Airfoil Book

The following announcement was received from Herk Stokely.

"The new wind tunnel work that Michael Selig and his graduate students have completed at the University of Illinois, is now on paper and will soon be available. This work is titled "Summary of Low-Speed Airfoil Data — Volume 1". It's volume one because of the continuing nature of the wind tunnel program at UIUC. We expect there will be a volume two (and more) based on the next period of testing which will begin during the next school year.

"Summary...." is 317 pages of narrative and data much like Michael's previous work "Airfoils at Low Speeds" (SoarTech #8). There is more narrative, and the book is organized differently, but it is obvious from reading through it, that it is the next installment of the same basic material. We've set the price at \$25 in the USA, which includes postage. All of the

actual tabulated data and airfoil coordinates (but none of the narrative or illustrations) in the book will be available on disk in ascii text files. The price for the disk in the USA will be \$15 including postage.

"When ordering the book from outside of the USA, add \$4 to the book price for international surface mail. For airmail to the Western Hemisphere, add \$6; airmail to Europe, add \$13; for other parts of the world, add \$17. For disk orders from outside of the USA, add one dollar to its price. All separate disk orders will be sent by first class mail.

"A significant portion of the price received from all book and disk sales will be returned to UIUC to provide part of the continuing support for Michael's ongoing test program.

"The printer will finish sometime in July, and I will begin filling orders for the book immediately. If you want to order the book and/or disk, you may do so now. SoarTech isn't big enough to handle credit card orders, but you can question me by email (herkstok@aol.com), or send regular mail to: SoarTech Publications, 1504 N. Horseshoe Cir., Virginia Beach, VA 23451." ■

SOARING EAST TO WEST

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ZIKA

Landing Tasks

Have you ever gone to a contest and overheard someone saying, "Gee there's too much emphasis put on landing tasks?" If I have heard it once, I've heard it 100 times.

It is curious that you rarely hear it though, from pilots who practice and consistently hit good landings. Most flyers who enjoy the camaraderie of competition flying know they must not only hit their flight times, but also understand the importance of posting solid landing scores. Top pilots are almost always within one or two seconds of the max time and have consistent landing scores of 90 to 100 points.

Along these lines, I received a letter from long time soaring enthusiast, Ray Hayes, of Michigan. Ray's letter addresses his thoughts on landing tasks, as well as some issues for clubs to consider. Here are excerpts of his letter.

"After 23 years of participating in all aspects of R/C soaring I still find piloting an R/C sailplane exciting, challenging and highly pleasurable. During this time, I have competed in soaring contests from coast to coast and from Canada to Florida.Because of my long interest in R/C soaring, I am expressing my views on the interest in changing the duration landing task values. Namely, de-emphasizing landing points. I am opposed to this because I accept the challenge that our present landing rule options give me.

"...There is little challenge to landing an R/C sailplane at a prescribed time without a target included. Recently, I participated in a contest that required landing within the field boundaries. No landing tape and no landing points. All the unpracticed contestants thought they had a real chance to win. Did they? The only thing that was different is they lost by fewer points.

"A consistently good landing score requires a disciplined practice program and therefore the reward points should not be diminished to accommodate those that do not want to practice landings. Anyone that objects to a landing task in a contest equal to the LSF Level II landing requirement is missing the object of a contest, i.e., a test of skills.

"...I believe R/C soaring is an art form proportionate to our individual flying skill levels. Mastering the art of thermal flying and not including the landing task is someone's idea of circumventing the hard part.

"...In the printed words of Mark Smith on page 18 of his Windfree construction manual, first printed in 1972: "Above all, remember the three most important things that one can do to become a really proficient R/C soaring pilot: 1) Practice, 2) Practice, 3) Practice."

"...Let's face it. The same good flyers that practice will still win contests regardless if their radio is programmable or they're flying three channels, or if there are no landing points. If you want to fly R/C sailplanes well, and win, then you should resign yourself to Mark Smith's advice of 23 years ago."

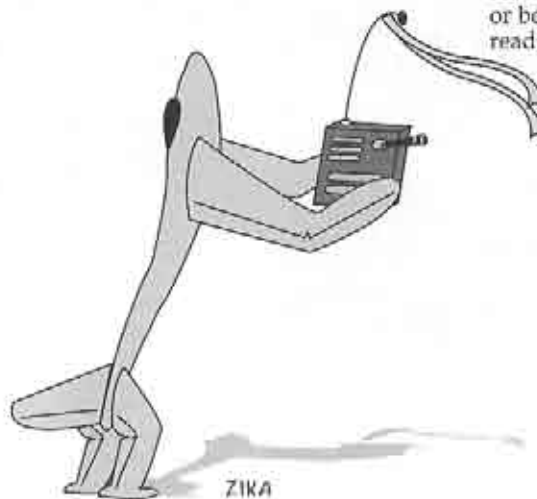
I found Ray's letter interesting and decided to call some flying buds from around the country to gage their thoughts. In my rather un-scientific poll, most echoed opinions similar to Ray's. Flying an R/C sailplane competitively, is mastering the art of

finding thermals, timing, and precision landing. If there are clubs or individuals who have developed a challenging format that de-emphasizes the landing task, I would really appreciate hearing about your experiences.

Ray also covered in his letter some food for thought on how clubs can possibly encourage newcomers and enhance their membership roster. Again, portions of his letter.

"...Many clubs are experiencing [stagnant] or lower membership rosters and lower enthusiasm among their members for good hard-nosed contest flying. (If you can't hit the top end of the landing tape, you can't win.) I believe this is caused by a lack of a structured club program that takes the newcomer through a planned process of skill level improvement.

"...A planned club training program using the LSF Achievement program will give the newcomers a reason to join the club. Power clubs are successful because they have a formal training program. Changing the club meeting format to focus on flying skills will have an immediate positive effect. Develop a ground school program for your meetings covering winching and landing techniques, how to detect thermals, building and ballasting.



ZIKA

"If a club wants more members, promote your club by contacting local media to announce flying events, field location and the club's president and phone number. Establish designated club flight instructors and put their names and numbers in each newsletter. Hold weekly or monthly LSF Achievement flying events and keep a journal on members achievement levels. Publish the members LSF progress periodically in the club newsletter.

"Hold monthly club contests with the members divided into two skill level classes based on their LSF Achievement levels. Promote the monthly club contests with a trophy that has individual plaques for each month. Inscribe the month and winner's name on each monthly plaque. The person winning the most monthly contests takes the trophy home for keeps at the end of the flying season.

"...One of the attractions R/C soaring offers is the challenge of learning to fly a sailplane well. If a club is focused on flying skills, it will have a strong heart beat and a healthy number of active flying members. The key words being active flying members."

Ray's letter offers up some excellent thoughts for new clubs to consider, and some good reminders for mature clubs.

Have you had a good club experience, or belong to a club that you would like readers to know about? Drop me a note and a photo and I'll be happy to include your club experiences in "Soaring East to West."

And speaking of club experiences, many thanks to the members of the Atlanta, Huntsville, and Memphis clubs for their untiring efforts to find my downed SBXT cross country ship during the MSSC cross country race in Huntsville. Thanks for the efforts guys... I'm sure it will turn up yet!

Thermals - Bob ■

LIFT OFF!

...with Ed Slegers
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Wharton, New Jersey 07885
(201) 366-0880 - FAX (201) 366-0549
9:30 AM - 5:00 PM (Closed Sun. & Mon.)

Electrifying the Vulcan

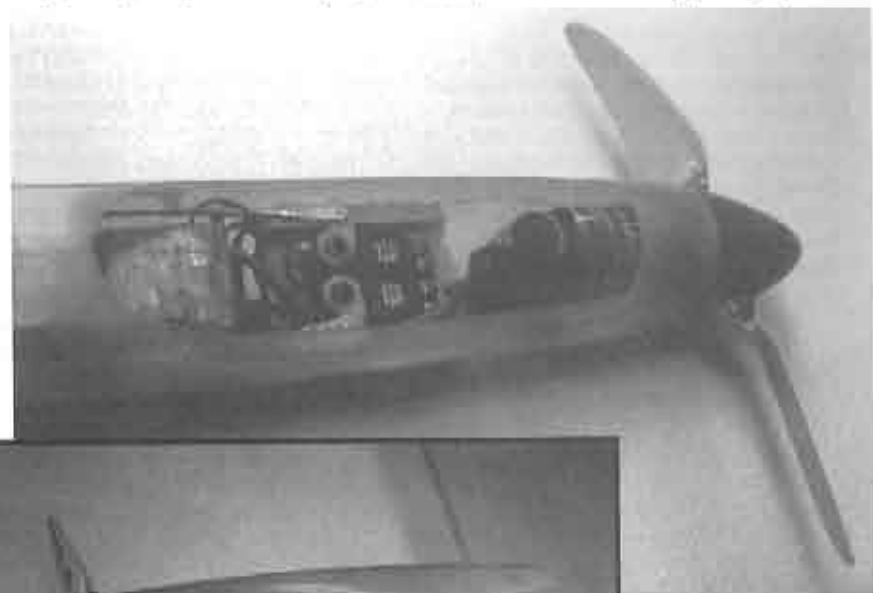
A few months ago, I wrote an article about building light. I used the Vulcan two meter. If you read the article, you might remember that light did not work as well as I would have hoped. I now had an airplane that I could ballast or do something else with. I decided that, if it needed more weight, why not make it electric. As you can see by the pictures, this is what I did. Having a completely built and flying

airplane made the conversion very easy. Also, the fact that the designer, Mark Allen, told me that he had the same thing in mind when he designed the Vulcan didn't hurt either.

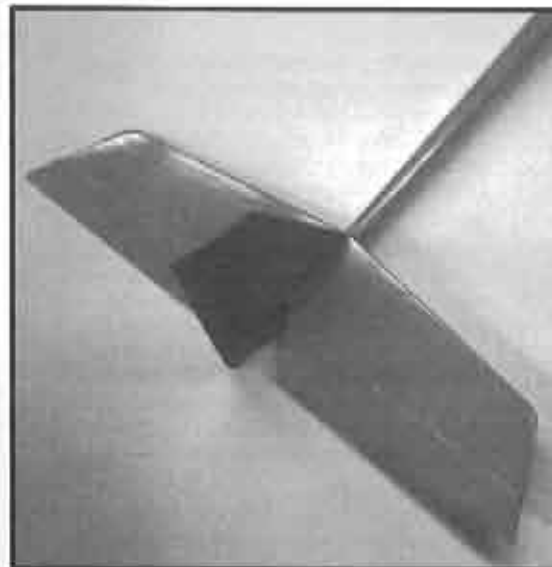
The first thing I did was to remove the servo tray and servos. By using the motor and motor mount as a guide, I cut the nose off of the Vulcan. Using the spinner as a guide, I glued in the motor mount. I then reworked the canopy to fit, as you can see in the pictures.

Servo tray and servos were reinstalled behind the motor. The receiver then went behind the servo with the speed controller on top of the receiver and the 7-cell pack behind the receiver. With this installation, the C.G. stayed the same.

Flight performance is incredible, and it is nice to have flaps on an electric. The whole conversion took less than two hours, and I haven't stopped flying it.

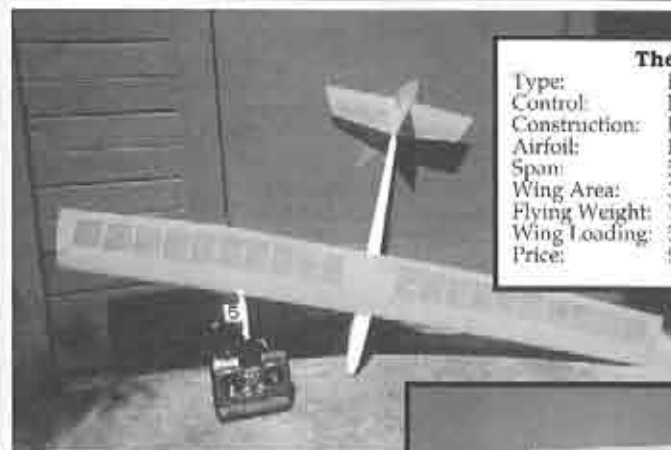


yet. If you are looking for a full electric sailplane, try this conversion. I think it will be very hard to beat. Another conversion I did was to go to a conventional stab and rudder. This



was something that Mark tells me that he also had in mind when he designed the Vulcan. If you do not like V-tails or are having difficulty in flying a V-tail, or you do not have a computer radio, this would make an excellent conversion. The handling characteristics are much milder and launching is not quite so difficult. If you would like to try this conversion, send a SASE and I will send you the measurements. There are many advantages to a V-tail, but personally, I like the conversion tail more than the V-tail.

I think that the pictures will answer most questions, but if you still have questions, just give me a call. ■



Thermal-Buster

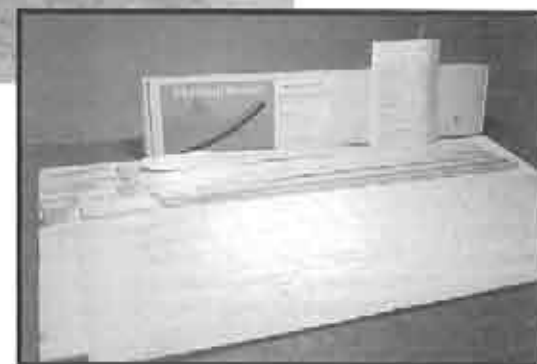
Type:	Handlanch Glider (HLG)
Control:	Rudder-Elevator
Construction:	Built-up Wood
Airfoil:	Eppler 205
Span:	59 in.
Wing Area:	354 sq. in.
Flying Weight:	13 to 14 oz.
Wing Loading:	5.3 to 5.7 oz./sq. ft.
Price:	\$ 30.99 (local hobby shop)

Kit Construction & Flight Review

K&A Models Unlimited Thermal-Buster

...by Jay S. Decker
Filer, Idaho

This is a construction and flight review of the K&A Models Unlimited HLG Thermal-Buster. The Thermal-Buster kit reviewed contained quality wood parts, resulted in a tough airframe, and flies well in light air. I recommend this



built-up wood kit as a first HLG or an intermediate plane prior to advancing to high performance HLG's which tend to be more fragile.

After thumping my first HLG into the

ground a few times on its first day at the local school yard, I decided to hanger this light weight plane with ailerons until my handlaunch flying proficiency improved. A few weeks later, I was at a hobby shop when I noticed a good looking two channel polyhedral HLG named the "Thermal-Buster". The kit had cleanly cut and sanded parts made from quality wood. With the kit and a one ounce bottle of CA, I went home.

The weather next weekend was rainy, so I put the Thermal-Buster together. It was simply that easy with quality parts, clear and simple plans, and accurate instructions. I did not vary from the instructions; there was no apparent need to... Until!

With a framed up structure, it was time to install the radio equipment. I wanted to install JR 341 micro servos in tandem with kevlar pull-pull cables for rudder and the elevator control to keep the weight as light as possible. I was not able to complete this installation because the fuselage was not deep enough to install micro servos in tandem under the wing saddle. I ended up installing conventional flexible plastic push rods salvaged from a crashed Graupner UHU and mounted the servos abreast. These push rods are relatively light, but much heavier than four kevlar threads. I finished the fuselage with white Black Baron Film, the flying surfaces with transparent yellow Monokote, and hinged the control surfaces with laced Monokote hinges. With all that push rod weight in the tail, I put a 225 mah battery, a JR "credit card" receiver, and three-quarters of an ounce of lead in the nose for balance. The total weight was 13.4 ounces, which is right in line with the manufacturer's specifications, but it could have been lighter! My total construction time was about sixteen hours. (I do not know if I build "slow" or "fast".)

The first flights of the Thermal-Buster were on a windy day with turbulence from nearby trees. The plane launched well, and flew O.K., but it was apparent that it is not for flying in rough air

or on a big slope; it did not have sufficient control authority with maximum control surface deflection. One of the built-up wing tips was crushed during this flying session when the plane was tossed into the ground by the turbulence.

In light air the Thermal-Buster is a delight to fly! It launches and thermals well and has enough speed range to get around. If the Thermal-Buster becomes your first HLG, you need to remember to keep the speed up a bit and fly it smoothly. The Thermal-Buster is just what I wanted to improve my HLG flying proficiency!

The construction modifications that I recommend to the kit based on my flying experience with the plane are as follows:

- If you want minimum weight and/or pull-pull cable control, increase the depth of the fuselage under the wing saddle 3/8 to 1/2 an inch to allow tandem mounted micro servos for pull-pull cable control, and hollow the nose block. This modification should enable you to save about an ounce or more of weight, by allowing a 100-150 mah battery extending partially into the nose block to balance the plane.
- To reduce the probability/frequency of wing tip damage, increase the spacing between the tip panel ribs to extend the outer wing panels so that the outboard ribs are within 1/4 of an inch of the tips, and replace the built-up wing tip with light 1/4 inch balsa rounded to shape.
- In order to save yourself from some minor repair work in a congested small space of the finger hole, reinforce around the finger hole with light weight fiberglass, balsa, and CA prior to radio installation.

I recommend the Thermal-Buster to anyone who wants a quality wood HLG kit, that results in a strong airframe, and flies well. It would be a good, first HLG, or plane to improve HLG flying skill prior to advancing to higher performance HLG's. Overall, the K&A Models Unlimited Thermal-Buster is an excellent quality wood HLG kit with good light air, HLG, thermal flying performance. ■

Seattle Area Soaring Society "Water Festival" Handlaunch Contest

...by Joseph Conrad
Kent, Washington

Weather is always a concern with thermal contests. You always tell yourself, "Stop worrying about the weather; you have no control over it, and there is nothing you can do. Just do your best on everything else and take what comes." The advice is good but, we still worry, and hope that worrying *will* somehow cause a change in the weather. It never does but, we still hope and worry.

The April 1995 contest was no different; we had rain the week before and rain the week after. Water was everywhere on the field. At times we were over ankle deep in standing water. But on Saturday the weather was excellent. *Great lift and reasonable wind* all day long; it was ideal. We started the contest and kept right on flying until the end.

We had originally thought to start the contest with the "Gun Slinger". This is a precision task trying to score 21 flights for a perfect score. Your normalized score is based on the number of flights that scored, *not* the amount of flight time. This task is good for the start of a contest to get things moving when little or no lift exists. However, we bagged the idea because the lift was in early, and pilots were specking out everywhere before we even started. So instead, we started with an add 'em up task, *minimum three flights*, first scoring flight had to exceed 15 seconds, and only flights longer than the *last scored* flight count. There would be unlimited throws and a 10 minute window. (Both tasks are discussed in length in the March '95 issue of *RCSD*, pages 48-50.) The rest of the tasks followed the standard format used in the previous contests.

Flying was very competitive between Phil Pearson and Joseph Conrad, both scoring 1000 points in rounds 1, 2, and 3. In round 4, Conrad got an edge on Pearson with another perfect 1000 point round while Phil scored 823.

However, in round 5, Conrad dropped to score a 759 with Pearson pulling his 4th 1000 point round to take the lead for 1 round. Conrad turned out to have no mercy though, continuing the "1000 point pursuit" with two final 1000 point rounds to take 1st place, finishing with 6 out of 7 perfect rounds.

The top three places were occupied by Phil Pearson *designed and built* planes, using his new Phil Foils. Great planes, great airfoils!

Jim Thomas was being generous in this contest. He decided to blow-up his plane during warm-ups to give the rest of us boys a chance. He changed planes several times and was experimenting throughout the contest. If you look at rounds 4 - 7 you'll see that Thomas was back on track. JT says, "Just wait until the AMA contest on May 27th. I'll take *no survivors*."

Steve Cameron was in a world of his own this day. When Cameron flies he generally has this second sense that moves his sticks and planes in the direction of lift. Not so in this contest. You wondered *who* was this guy out there flying Cameron's plane. If the lift was to the left he *went right*. If the lift was down wind, he *went up wind*. But, whatever was going on, it was not the normal Cameron flying that plane. It *did* help when he was your timer though. If he said, "Go left," no problem; *just go right*, and boom, you're skied!

Jim Pearson was up to his usual style, "Stomp-em when they ain't lookin'!" Jim has this uncanny way of finding the air when nobody else can or does. In Round six, we had a 15 minute window to score three flights totaling eight minutes. The air was good the first eight or nine minutes, then enter the sink cycle. Conrad had flown 12 seconds off a perfect score of eight minutes on his first three throws. Then everything went dead. Nobody, I mean nobody, could find up air, *except* Jim. During that down air, Jim pulled within four seconds of Conrad's score. You should have seen the faces of the other pilots as Jim racked up the air time. The closing of the window is the only thing that stopped him.

Sherman Knight lived up to his name, *jousting* with every plane in the crowd. He had at least three mid-air that I remember. It was not Sherman seeking out the other planes. In fact, as his timer during a round, I heard him muttering, "Stay clear of that wolf pack, Sherman," and he moved clear of the group. But, it still seemed as if Sherman's plane was putting out pheromones (or something). Planes kept aggressively trying to make contact (and did). Maybe, at the next contest, we'll have some kind of a baby Monarch-Pitch Moth, as a result. In the final round, *another* mid-air, that was it, his plane was spent and he called it a day. (Is it possible some of these planes *remember* the 9 minute 58 second flight of death from last summer?)

It was good to see Michael Frederick out flying. He showed up with what looked like a C.R. Aircraft "Climmax". Every time you turned around, Michael's plane was flying with incredible energy, climb rate, and speed. I said to myself, and out loud more than once, "Boy, the airfoil on that plane is something. Look how well the plane is performing. It's incredible!" It made me wonder if I needed to rethink what I was flying. (When you fly one of Phil's planes, it takes a lot to get your attention, and Michael had mine.) After the contest, I found out that it was a Climmax, all right, but Michael was using a *Phil Foil* instead of the stock Climmax wing. Well, that was the end of the concern over planes for me, again.

Don Bailey still scares me; this guy reads air magnificently. When the lift is there, he's got it. Don did make a comment I can't quite remember, but it was something about, "The only thing

I hate more than ????? is losing." Don will have to remind me what it was he said. With Don's love for handlaunch and his building skills, we are in serious trouble here. Remember, Don picked up handlaunch *one year after* the rest of us.

Jeff Morris completely folded the wings on his primary plane in the first or second round. I think that made the day a little unsettling. He continued to make changes and adjustments the rest of the day. Morris is usually knocking out 1000 point rounds to the regret of the other pilots.

This contest was fun! We did lots of flying and enjoyed the day. Thanks to John Fuller and Pete Hintz for their help with the scoring. Charlie Harris, as always, helped with the flight groups and got the scoring started. Charlie Baumgartner timed the windows for us, with Jim Muri filling in to give Charlie a break. Thank you, Dan, for checking the scores in question. Those who came to work as timers were a big help; we all learn together.

P.S. I flew up in Canada with Cameron and JT the following weekend. Same old fumble fingers was flying Cameron's plane until Round Four. Then Cameron showed up, and I got to tell ya, whoever *was* flying Cameron's plane is gone. Steve started reading the air and turned his plane into a thermalater. At the end of one flight, while walking to the landing lines, he did a direct quote from the movie "The Mask". And I quote, "Somebodyyyyyyyyyy Stopppppp Me," while he smiled and shook with excitement. We are in trouble boys, *The Man* is back from vacation! ■

Handlaunch Results April 15, 1995

	Round							Total
	1	2	3	4	5	6	7	
Joseph Conrad	1000	1000	1000	1000	759	1000	1000	6759
Phil Pearson	1000	1000	1000	823	1000	637	941	6401
Jim Pearson	920	983	560	946	697	987	932	6025
Steve Cameron	862	877	673	550	1000	958	1000	5920
Jim Thomas	768	915	217	957	1000	1000	967	5824
Sherman Knight	812	557	1000	1000	663	965	*150	5147
Michael Frederick	535	604	973	775	369	760	596	4612
Jeff Morris	313	748	447	508	322	477	737	3552
Don Bailey	257	419	200	543	678	673	566	3336

*Mid-air



Sherman Knight with Monarch

The Future Is Hand Launch The Metamorphosis of The Monarch

...by Sherman Knight
Bellevue, Washington

Hand Launch is quickly becoming one of the most exciting and innovative areas of remote control sailplane. The hand launch class only has two limitations: (1) A 60-inch wingspan, and (2) all launches must be by hand toss. This article is about a pre-manufactured kit called The Monarch. This kit can be obtained from Joe Hahn at 719 Fisk Street, Piqua, Ohio 53506. The kit costs \$115 in a pure kit and \$165 for a pre-sheeted version. Replacement fuselages and wing kits are also available. This is the most complete kit that I have ever seen.

This article will cover both versions of The Monarch, the original Monarch which was available in 1993, and the new Monarch-94. This article will also discuss the creation of an aileron Monarch using the wing available for the kit. The kits are **extremely** complete. The balsa wood is the lightest I have ever seen.

THE FUSELAGE

The fiberglass fuselage and canopy is one of the lightest ones that I have seen, weighing in between 1.4 and 1.6 ounces. It has more than ample room for all the necessary radio equipment. The fuselage is significantly different

from most hand launch models. The servos lie down flat in the fuselage. In other words, the fuselage is almost 2 inches wide, but averages less than 3/4 of an inch thick.

The Monarch-94 fuselage has been reinforced from the earlier version (the addition of Kevlar™ tow in various parts of the fuselage), and a new canopy. The new fuselage is slightly larger than the old one giving it greater access for the placement of servos, batteries and receivers.

Part of the reason that the fuselage is so lightweight is because so little resin is used. There are **thousands** of pinholes. These fill quite easily with the glazing and spot putty available at most automotive stores. It's great for filling pinholes because it dries within a few minutes and can be sanded almost immediately.

A putty of epoxy and microballoon was used to give an extra tight fit to the canopy. (Coat the canopy with water-soluble jelly so that the epoxy does not stick to it.) When dried, sand the epoxy smooth for that perfect canopy fit.

The wing saddle for the V-tail is already formed and attachment is very quick and easy. However, every fuselage that I have received has had a somewhat warped or twisted fuselage boom. This is easily repaired by slowly heating it with a monocoat heat gun (or hot water) and slowly twisting it back into place.

One of the most interesting features of the fuselage is the self-closing trap door for the fingerhole. On this model, a fingerhole is absolutely critical. Launching performance would suffer greatly if not used because there is so little fuselage side to grab onto. If you

have small hands like mine, there is enough width in the fuselage to include a two-finger throwing hole.

The wing mount bulkhead, along with the hooks for the canopy retainer are already epoxied in place. Other than the items mentioned before, all you have to do to the fuselage is to cut your own fingerhole and install a plywood block for the wing hold down bolt. (The kit even provides a self-tapping metal screw to tap into the wood bulkhead in case you do not have that size in your tap and die set.)

THE WING

The wing also changed between the 93 and 94 models. The Monarch 93 wing is very thin. Monarch 94 is even thinner. At the wing tip, the thickest part of the 94 wing is just a hair over 1/8 inch thick.

All of the wings are white foam cores with 1/32 inch balsa sheeting. Although the plans and specifications call for the use of alpha-numeric (white) glue for wing skinning, it is just too slow for me. Although the instructions infer that the use of epoxy glue is too heavy, I could not disagree more.

The Monarch 93 wing had a tendency to break. That has been cured in the new kit.

This problem appears to come from the fact that the leading edge of the wing near the fuselage can be damaged when hand caught. If you damage the leading edge of the wing enough, it is like putting a ding in your windshield. The crack has got to start somewhere. Over time, the Monarch 93 wing may fracture on the top side.

The Monarch 94 wing has significant reinforcements using 1 in. fiberglass tape. However, the tape is not provided at the typical spar location. Instead, 1 inch fiberglass tape is added to the top and the bottom of the wing at the leading edge and then an additional 12 inch length of fiberglass tape is laminated to the outside of the wing of the leading edge. With these reinforcements, the new thinner wing has no more breakage problems.

Making a light, balsa-skinned wing is simple. First, you have to use a thick epoxy. Second, once applied, to the wingskins, you have to scrape it all off.

For years, I have used plain old Hobbypoxy 2 (very thick stuff) for vacuum bagging balsa skins (Scorpion, Alcyon, Dove, Samurai and the first two Monarchs). Hobbypoxy 2 is relatively thick, and it does not appear to soak into the balsa wood. Then, you scrape as much of it off as you can, using a four-inch plastic paint scraper. Scrape hard! (A credit card is not stiff enough!) Scraped off residual epoxy should slowly turn the same color as the wood. This indicates that you are actually removing wood fiber along with the epoxy.

Place the foam cores inside the wingskins. Then place the cores and skins inside the beds; finally, place the entire assembly inside the vacuum bag. Then, using a small vacuum bag system, only pulling six or seven inches of mercury; let it sit overnight.

Sand the appropriate angles between all the polyhedral and dihedral sections. Glue them together. Place fiberglass tape and epoxy resin at the joints. The Monarch can be built in a weekend of evenings.

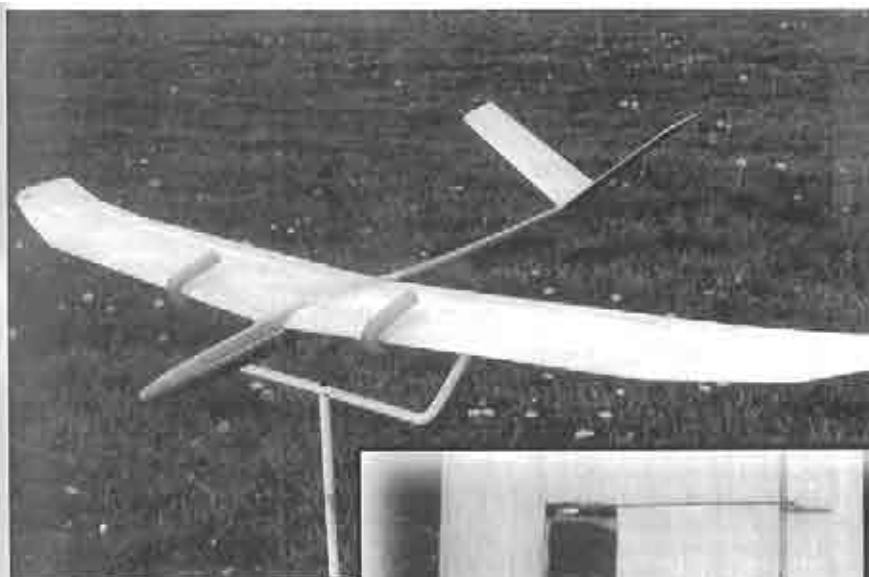
The first two Monarchs came in at the same weight: 10.1 ounces. The original Monarch 93 was too light. The somewhat thicker wing seems to fly and launch better at 11.1 ounces.

The Monarch 94 is a different matter. I added an additional ounce of weight to experiment and found that it did not throw any higher or float any longer. The new super-thin Monarch 94 wing performs as advertised.

THE EXPERIMENT

One of the nicest features about hand launch flying is that it is so easy to experiment. You can build a new wing in an evening. The first experiment was to install less polyhedral and dihedral angles in the 94 wing. The original model tail wobbled too much. Reduction of these angles virtually eliminated this problem. Flying hand launch will cure many pilots of a common problem: letting go of the stick. We all do a pretty good job of flying into the turn, but most of us then just let go of the stick! We don't fly out of the turn.

The second experiment dealt with the addition of ailerons. I just happened to



have an old Monarch 93 wing kit and decided to convert it to ailerons. I started by gluing the center wing foam core to the wing tip. Then, I sanded the joint smooth. Then, I glued the wing beds to the wing tip beds so that the inside face was smooth. Then, I sanded to remove all of the fuzz and the hair on

the inside of the bed and on the cores. This provided cores and beds for a new, one piece continuous wing.

I also replaced the fiberglass tape with 3/10 ounce carbon fiber mat. I placed a 1 inch wide strip at the leading edge all the way to the wing tip break, diamond patterned from the center section out approximately 18 inches, and a 2 inch wide piece of carbon fiber mat top and bottom for the full length of the ailerons.

I then vacuum bagged each wing with 1/32 inch balsa. Each wing was bagged in one piece. Then, I installed the wing tip blocks and sanded to shape. After the wing was complete and sanded, I cut four inches off of each wing tip and sanded in approximately 8 degrees of polyhedral angle. I then sanded the center section to a 4 degree dihedral angle.

The ailerons are full span. They start approximately 1 1/4 inches from the

fuselage and extend all the way out to the polyhedral brake (4 inches from the wing tip). This presented some problems, as the wing plan for the Monarch has some other interesting attributes. The trailing edge of the wing is not straight. At the original polyhedral break, it tapers 3/4 of an inch to the rear. Because I wanted to install constant taper ailerons all the way out to the polyhedral break, this presented some control surface difficulties.

To solve this problem, the ailerons are actually cut into two pieces, from the center all the way out to the trailing edge break and from the trailing edge break all the way to the polyhedral break. I then had to create some way for the outboard aileron to follow the inboard aileron. This was surprisingly easy to accomplish using some Airtronics gap seal tape. The gap seal tape is a 10 or 12 ml. clear mylar with adhesive on one-half of one side. By

placing the adhesive side on the inboard aileron with the non-adhesive part covering the outboard aileron, I was able to achieve a sure and definite mechanical means of moving the outboard aileron.

I taper cut the ailerons at 22 1/2% of cord, theorizing that when changing camber it would create the same airfoil throughout the wing platform.

Then, to further the experiment, I decided to try some of the West System's epoxy resin. I purchased this epoxy (501) and its compatible hardener (206). Because the epoxy was so thin, I thickened it considerably with the use of West System's colloidal silica (406). The silica thickens the epoxy considerably without adding weight. I then used the same plastic paint scraper that I used before. (First, spray a light coat of 3 M 77 adhesive spray on the back of the carbon fiber to hold it in place on the wing while you add the epoxy.)

Pay careful attention to this really thin, carbon fiber mat. Although it is not easy to see, there is a bias to the weave. You will find that you can easily pull it apart in one direction, but it is very difficult to pull apart in the other direction. The "difficult to pull apart" direction should run the length of the wing.

The new Monarch, with four servos and an increase in battery size to a 250 Mah pack, increased the overall weight of the Monarch to 12.1 ounces.

Wow! Does it fly nice! It was difficult to decide which of the two wings to fly at the World Soaring Jamboree. I flew the aileron version and finished 4th. The ability to change camber in flight is worth the extra weight. I am very impressed with the kit provided by these people. It is well worth the money spent.

THE FINISH

The finish? What finish? The fuselage is that real boring-looking epoxy resin and fiberglass look with red spotting compound all over it. With my first two wings, I tried various types of varathane. First, I tried liquid plastic varathane exterior wood finish. This darn stuff took over 24 hours to dry. That quart is now for sale.

Next I tried McCloskey's Heirloom crystal clear acrylic varnish. This stuff was also a mistake. The water based content of the material soaked into the wood and different types of grain expanded differently. One wing all of a sudden became flat, and the other one tried to turn inside itself like a potato chip. However, I placed the wings back inside of the bed, put some light weights on top, and allowed a few days to dry. Once dry, the original shape returned.

The best finishing system that I have used so far is West System's epoxy thinned with isopropyl alcohol. This epoxy is thin to begin with, and then you thin it more with 10% to 20% isopropyl alcohol. You continue to stir it until it turns clear. Then, take a piece of foam rubber (Do not use those foam rubber brushes, as they break down too quick.), and rub the epoxy finish on. Rub it on very thin.

The finish sands very easily (no dust), and it seems to provide you with a much harder and durable finish than the polyurethane or varnishes. It does not appear to be any heavier.

CONTROL SET UP

With the amount of elevator throw recommended in the plans, I found the Monarch to be nearly unflyable (too sensitive). V-tail mixing is best done with the use of a computer radio. Mechanical mixing is limited. With computer mixing, you can mix differential movement at the V-tail. If the aircraft pitches up or down during a roll, it is easy to program in more counteracting down motion in the opposing ruddervator.

If you decided to build an aileron Monarch, use less rudder mixed with ailerons, than what you use with the polyhedral version. I have discovered that too much rudder mix induces tip stalling.

THE LAUNCH

The most difficult part of trimming out a hand launch aircraft is getting it to fly as slowly as you can and, at the same time, obtaining a slight climb during launch. The first two Monarchs required a launch setting so that the aircraft would climb to altitude. Changing the wing to tail surface

incidence will also affect this issue. If you have an aircraft and you want to make it climb during the launch, try shifting the weight further forward. Moving the C.G. forward results in a plane that wants to pitch up during launch speed, but may suffer in floater performance.

THE FINGERHOLE

The fingerhole in the Monarch takes a little getting used to. Most hand launch aircraft involve a single fingerhold that is quite deep and fairly close to the trailing edge. With the Monarch, all that you can insert into the fuselage is your fingertips. The fuselage under the wing is slightly more than 1/2 inch thick.

Therefore, it is important to be able to hold onto the sides of the fuselage ahead of the wing. I strongly recommend placing the fingerhole as far forward in the fuselage as is possible.

THE FOURTH EXPERIMENT

I just received a new Monarch 94. It will also be converted to an aileron ship. I've ordered four of the light-weight Cannon servos. I expect the

flying weight with 4 servos and a 250 mah battery pack to come in around 10.5 oz. I'm also going to increase the control surfaces to 30% of chord. It's gonna be fun.

The Monarch has been a fun and exciting aircraft to fly. I have found that unless I leave my hand launch airplanes at home, I do not even unpack my unlimited class aircraft anymore. This hand launch bug is amazing. There is a softball field across the street from my office, and I find myself there quite often at the lunch hour. In the evenings, my daughter's school yard is less than four blocks away. These sites are nowhere large enough for setting up full-size launching equipment but work great for hand launch.

I must thank Joseph Conrad and Phil Pearson for introducing me and the Seattle Area Soaring Society to the most fun and rewarding form of thermal sailplane contest flown today.

This hand launch stuff is great! You gotta try it! It's really fun!

Good luck! ■



Photo 1
"Tools of the Trade"

...by Robin Lehman
New York, New York

August 1995

For those of you who fly larger airplanes, and use battery packs that are over 1,200 Ma in size, there are a few things that I have recently learned about batteries and charging which is very basic knowledge. For those of you who already know this - well, ho-hum and skip on to the next article. For those of you, however, who do not know this, sooner or later this will save you one or more airplanes.

Most of my airplanes have 1,500 to 2,500 Ma battery packs in them, and so the standard charge I get from the battery charger which comes with the



Photo 2



Photo 3

(Futaba) radio is not sufficient. That charger will really only charge up to 500 Ma, and beyond that you will not get a full charge from that charger.

Because of this I have used the Digipace I and more recently the Digipace II (from Ace R/C). This unit is fine for any battery packs up to 1,200 Ma, but is inadequate for larger packs. To get a full charge on a battery pack, it should be charged at 10% of its rated Ma value for fully 16 hours (on a discharged battery). To clarify this the math is as follows, for example: A 1,200 Ma pack should be charged for 16 hours at 160 Ma, while a 2,500 Ma pack should be charged for 16 hours at 250 Ma.

Ace R/C makes a very handy charger - the Dual Metered Vari-Charger or DMVC - (photo #1). This magical piece of machinery automatically figures out what voltage battery you are charging. Plug any sized battery up to 2,500 Ma (4.5, 6 or 9.5 volts) into either side of the charger and dial in the appropriate Ma for the charging (as mentioned above). As you can see, there is a nice DC Ma scale which will give a Ma reading of anything from 10 to 250

(photo #2). Once your battery is fully charged then you can turn the knob down to trickle charge something between 10 and 25 Ma. In the instruction manual Ace claims that you will not damage the battery by charging more than 16 hours at its full Ma rating.

For discharging a battery, and checking it out, the Digipace is an excellent tool for: A) cycling a battery, or B) finding out how much is left in the flight pack you have just used. But if you wanted to be certain about your charging, after you have recycled or drained your battery put it on the DMVC or an equivalent charger. The problem with the Digipace for recycling is, should you have a current surge or a slight outage of electricity, it can switch to its trickle mode and you could be flying on a flight pack which has almost no life left in it, as it was never charged. This brings us to our third very handy tool.

Ace makes the VoltMaster II (photo #3), which will save your airplanes. As you can see (photo #4) there is a meter status knob which will give you readings from 4 to 10 celled battery units. The most important feature of this handy unit, however, is the load status button (photo #4). As you can see there are two positions: 500 Ma and 200 Ma. The 200 Ma position gives you a good reading of what your battery will put out UNDER LOAD. The 500 Ma position is for load status which I don't use because it takes too much out of the batteries and seems to give inaccurate readings. The consensus of opinion is, "Don't use it."

Before each flight, it is not enough simply to check the voltage on a battery, you have to check the battery under load in order to find out if you have enough battery to fly your airplane! This Ace VoltMaster will do just that. If you have a good battery, when you push the "engage load button" (photo #4) the meter will go down to the left a few notches and stay there. If you have a low battery, however, under load the voltage will continue to drop. In order to give a fair test, you should hold the "engage load" button for 20 seconds. This is especially important for those of you who love to catch thermals and may stay up for a long time.

Last but not least, if your tried and true battery begins to give less and less flight



time, it's giving you some warning that there is going to be a cell failure in the relatively near future. The Voltmaster II may help you out with some advanced warning of a problem.

It doesn't really matter whose charger you use as long as the charger will fulfill the above functions. As to a volt meter to check your batteries on the spot,



if you can find another volt meter, any will do, but the only one I have found that does the job UNDER LOAD is the VoltMaster II. I make the habit of checking every on board battery under load before EVERY flight.

Happy Landings!

P.S. Most of this information comes via Larry at S & R Batteries and other people I fly with, for which many thanks!

Understanding Sailplanes

...by Martin Simons

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13 Loch Street, Stepney,
South Australia 5069

Flight Without Figuring Part 5 Continued More about wing sections

Finding the camber

The camber line of a profile may be found by plotting a row of points midway between the top and bottom surfaces. For the most accurate results this should be done by the method shown in Figure 2. With a large drawing of the section on plain white paper, fit circles of different sizes into the outline at as many points as possible. Mark the centres of the circles and join them with a smooth curve. The result is the section camber line.

The easiest way of doing this in practice is to draw a whole lot of circles of various radii on a piece of tracing

paper, using simple school compasses. Slide the tracing paper about over the section drawing to a place where a circle fits, just touching the top and bottom surfaces. Prick through the centre. Move the tracing to another position and find another fit, and prick through, repeating with different circles until there is a long curved row of prick marks, which should be joined up to show the camber line.

It is not necessary to do this every time a new section is examined but it is useful as an occasional exercise.

A rough idea of the camber can be found more quickly by measuring, with a ruler or dividers, a few points equidistant between the top and bottom lines, and sketching the curve. Computer programs are available now which do a better job in much less time, once the section ordinates are put into the data bank. Often, information about the camber line is given in some form by the section designer.

All these methods lead to the same point. Whatever the external appear-

ance of the section, there is a camber line inside it. The shape of this inner skeleton has fundamental influence on the behaviour of the wing in flight. Sections which look superficially alike may differ a good deal in camber.

A symmetrical wing section has an uncambered skeleton, a straight line, surrounded by a thickness form which gives exactly the same shape on the top and bottom surfaces of the wing.

Any wing which is not absolutely symmetrical has camber. It thus makes no sense whatsoever to speak of a section as 'semi symmetrical', for example. A section which is not perfectly symmetrical is a cambered section and what matters then is the shape of the camber line. A section cannot be semi-cambered any more than someone can be semi-pregnant.

Either someone is pregnant or not. Either a wing is cambered, or it is symmetrical. Knowing the difference, in either case, is important!

Some examples are shown in Figure 3. The wing sections here are cambered. The shape of the camber line is indicated each time.

Figure 4 shows another important point. Four sections here, all from the famous NACA four digit series, have the same camber exactly.

When a camber line, of a certain shape and amount of curvature, is buried in a thick wing, the external appearance of the profile often produces a section which is bi-convex, like the 4415. If the same camber line is buried inside a thinner section, very possibly the under surface of the wing will come out flat, or nearly so, like the 4412. If the wing is thinner again, the under surface may be partly concave or undercambered, as with the 4410 and even more with the 4409. Further thinning approaches the membrane or film type of section. Thickening or thinning a section certainly does make a difference to the way the wing flies, but since the camber is the same in all these examples, those aspects of the wing which are chiefly affected by camber, will be the same.

From this it follows that terming a wing section 'flat bottomed', 'bi-convex', undercambered, etc., does not

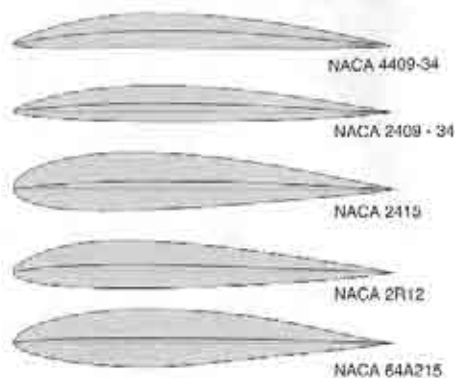


Figure 3
A number of wing sections with various amounts and types of camber. Behaviour in flight differs. The camber line is shown in each case, with the true chord line

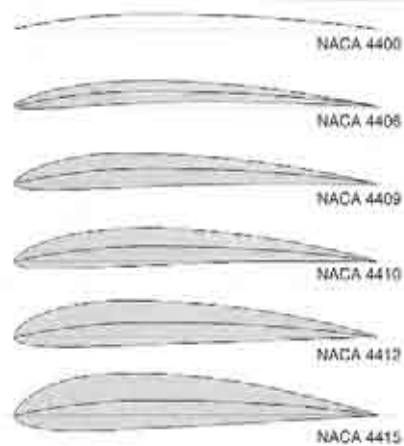


Figure 4
Four wing sections with the same camber but different thickness. In many respects, behaviour in flight will be similar.

mean a great deal in aerodynamic terms. They may be of some interest in the model builder's workshop. Flat bottomed wings are slightly easier to build than any other form. For this reason there is some value in mentioning this feature. Undercambered wings require more care in covering or skinning, bi-convex wings may need special jiggling or propping up during assembly and so on.

On the other hand, using the external appearance of the wing to describe its aerodynamic qualities, is almost always misleading. ■

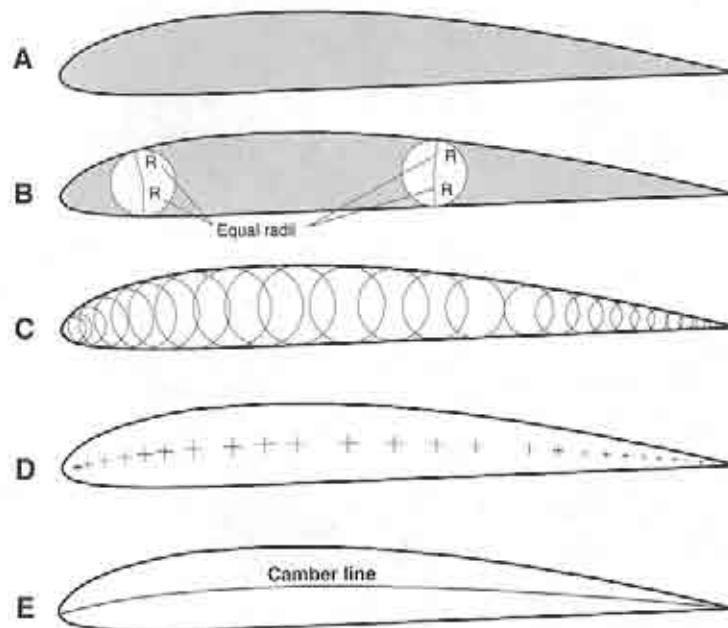


FIGURE 2

FINDING THE CAMBER LINE.

At A the wing section is shown.

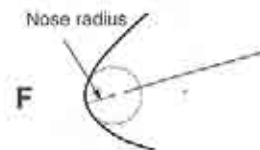
At B the method of fitting circles into the outline is shown. Note that the true thickness of the section is shown by the circle radii, not vertical straight lines

At C the outline has been filled with circles, each of which just touches the top and bottom surface of the profile.

At D the centres of all the circles have been marked.

At E the circle centres have been joined with a smooth curve. This is the camber line of the profile.

At F (below), greatly enlarged, the slight anomaly that arises at the extreme leading edge is shown. The smallest circle that will fit into the outline of the profile, gives the nose radius. The camber line does not go exactly through the extreme leading edge but passes slightly below it. This does not usually make a significant difference.



AERIAL PHOTOGRAPHY

...by David Garwood
Scotia, New York

Paragon makes thermal turns over high school track. Bob Powers' Ace Quasoar circles at slightly lower altitude.

In the August 1994 issue of *Model Aviation*, David Garwood shared his secrets on how he takes aerial photographs from sailplanes. The photographs shown here were not included in that article, and provide an excellent bird's eye view from above.

David's Paragon has a 120" wing span with an enlarged fuselage, and the camera is carried in the open bay under the wing. He uses a compact Olympus Trip MD camera, which has a servo controlled shutter release mechanism.

If you want additional information from David, he is the new "Soaring" columnist for *Model Aviation* with their September 1995 issue. His address is: 5 Birch Lane, Scotia, NY 12302-5514. ■

The forest cover of the upstate New York landscape is apparent in this shot from the school yard flying site. Bob Powers' Ace Quasoar sets up for landing in cleared area, which is the size of four soccer fields.



The Olympus Trip MD camera servo controlled shutter release mechanism. From right to left, the components are: popsicle stick attached to camera with double sided servo mounting tape, screw providing adjustable distance to shutter release button, loosely fitting wire linkage, and Royal Mini Titan servo secured to camera side with more double sticky servo tape.

A bend in the Mohawk River shows boats and an industrial plant. Photo taken from Pierce Aero Paragon, which was launched from the field in lower left.

Flying in slope lift from large, gentle hills in the Hudson River Valley of upstate New York, the Quasoar passes under the Paragon camera plane.



"I've enclosed a picture of our friend, George Hollidge, at the 'Moment Of Truth.' This was taken at the recent NCSL contest sponsored by the Diablo Valley Soaring Society. I really like this picture, because for once I lucked out and captured the exact release time. This is always a tense moment!"
...Don Whiteside

Repair of RnR Molded Wings

...by George Hollidge and Don Whiteside

Pleasant Hill & Lafayette, California

ARGHHHHH!!! My Genesis has just popped off the winch line and is going downwind out of control. Am I going to clear the oak tree? Yes! Nooooo... WHACK! SMASH! CRUNCH! It pancaked in upside down at the base of the tree. Parts are drifting down wind... Not exactly what I had hoped for on my second day of flying my new (used, but in perfect condition) RnR Genesis. I can assure you my first thoughts and words were not, "Oh, what a great learning experience this will be." I'm still a bit embarrassed about the language I used.

My biggest hesitancy in buying the all molded Genesis was, "How would I repair it if it ever crashed?" "Don't worry," my friends told me. "It's not like slope flying. Some of us go a whole season without crashing our planes." Right, guys.

Anyway, it is now a few weeks later and the plane is completely repaired and is actually stronger than before. The crushed section of the wing is a

perfect airfoil shape again and the plane only picked up about two ounces.

The following is a report of my observations of my friend George Hollidge's repair of the Genesis. George really deserves all the credit for this article. He is the technical wizard that generously showed me how to repair the Genesis, he wrote sections of this article, and edited it for accuracy. Thank you, George! All mistakes and grammatical errors are my own.

Now that the repair is finished, my overall impressions are: 1) Even I could do it again; 2) It is probably easier than fixing a similarly damaged foam, carbon/glass/obechi wing, and; 3) There are very distinct advantages to all-

molded airplanes from RnR!

The primary advantage of the RnR products, compared to many European molded planes, is that the spar goes ALL the way to the top and bottom skin of the wing. The rohacell layer is tapered and ends at the edge of the spar. The lamination at the top of the spar is: 1) outer gelcoat/glass, 2) carbon spar cap, 3) interior glass, and, 4) spar (balsa or blue foam). This means that delamination is repairable. On a wing with a lamination layer (such as rohacell) between the exterior layer and the spar, you cannot effectively repair this area and retain the necessary strength. (See Diagram # 1.)

Repairing the RnR Wing

There are certain things to consider before ever going to the flying site and launching your plane. This may seem to be negative thinking but, I've heard of guys enclosing a plastic trash bag during the building process so they'll have something to gather the pieces with after the crash. THAT'S negative thinking!

A suggestion from George is to bring tongue depressors and masking tape to the flying field with you. In the event of a crash, carefully splint the airplane

without bending or moving the broken pieces. Sounds like human first aid! The goal is to do no further damage and to lose no parts. I was amazed, later in the repair process, how little bits of glass and rohacell were used to facilitate the repair. If I'd left those behind or thrown away pieces I thought useless, it would have been a more difficult repair job.

Another important hint is to just put the plane out of sight for a few days. When you are in a calmer frame of mind, carefully examine the glider. Decide if the pieces are repairable. Is there major structural damage (i.e., a broken or damaged spar, very extensive delamination, rippled skin over so large an area it is not worth the time, etc.)? Everyone places a different value on their time and you must decide whether you want to continue the project. It will be easier than you think but you must have the time and be willing to spend it.

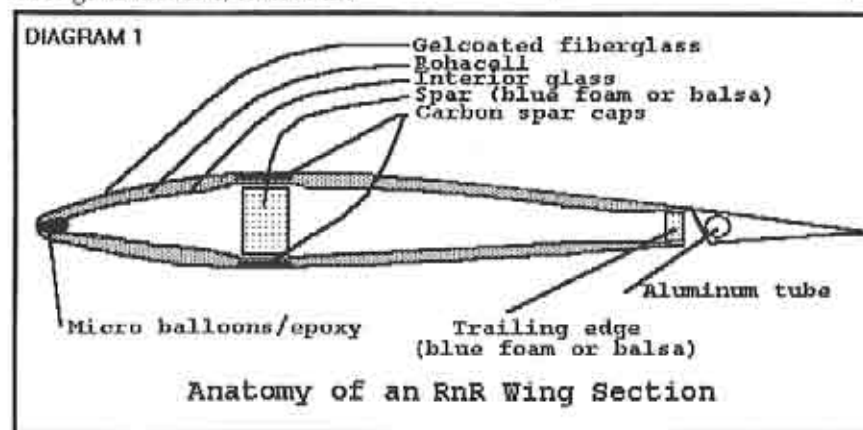
George analyses how the impacts or other damage occurred and tries to determine whether there is structural damage and just how to refit the glass and rohacell pieces back the way they started. Most repairs are essentially the reverse of the original molding/manufacturing process. Part of the repair process is to first understand the wing components and their design and assembly. This will also aid you in understanding why that \$1000 European plane is irreparable and why the RnR wings can be fixed!

Your goals are to: 1) Relieve the

tension caused by the crash; 2) Repair the structure (spar, leading edge support, etc.); 3) Reestablish the lamination layers, and; 4) Recreate the original airfoil shape.

Tools and Materials

- 1) A selection of "long reachers". These can be made from wooden dowels. You'll need to attach an epoxy brush (cheap acid brush with a metal handle) to a dowel and bend the bristle end to the correct angle.
- 2) Various cutting tools - Exacto knife, razor saw, etc.
- 3) Adhesives - Foam friendly thin CA (Regular CA can be used well away from any blue foam.)
- Structural Epoxy (EZ-LAM or West 125)
- Bonding epoxy - Should be easy to sand (West 105)
- 4) Salvage tape - This is 6 and 9 ounce fiberglass tape that comes in widths from one inch to 4 inches. It is available from TAP plastics. The sides of the tape are woven so that it won't unravel. **IMPORTANT:** when you cut the salvage tape to the lengths you will use, cut it a bit long. Then, apply a thin coating of CA to the newly cut ends, and re-trim to exact size. This will prevent unraveling at these edges.
- 5) Rohacell - If you need 2 mm rohacell, it is available from Composite Structures Technology



and Aerospace Composite Products. They both advertise in RCSD.

- 6) Colloidal Silica - (such as Cab-O-Sil from TAP Plastics)
- 7) Finishing fiberglass - (2 oz.)

Needless to say, you should work in a well lighted, well-ventilated area with a large flat surface.

The Repair Process

Please review all of the following instructions before proceeding. Your repair may necessitate working in a different order than we have outlined. Throughout the repair, work slowly and carefully, using adhesives that give you adequate time to insure proper fit and placement.

Have your long reaching internal tools handy. This means the dowels, epoxy brushes with extended handles, and whatever other little gimmicks you can use to get deep in the wing.

Always try to do "dry runs" with the fiberglass and rohacell. This means placing the components in their proper positions, using the long reaching tools, etc., to make sure you can actually reach the area and place the material properly. It will be more difficult once the glass is sticky with epoxy!

If the damage is "deep" in the wing (near the root), you may have to cut windows to work through. Try to cut them away from the spar in the bottom of the wing. This will make airfoil restoration easier.

1) STRENGTHEN AND REPAIR INTERNAL STRUCTURE. If the spar is weakened, carefully sand the weakened area to aid adhesion. Next, lay 200k carbon tow, wetted with structural epoxy against the spar. With the epoxy still wet, add a "U"-shaped layer of 9 oz. selvage glass. (See **Diagram # 2.**)

For leading edge damage, first repair any delaminations (see the next section) and cut away any irreparable surfaces. Next, lay a layer of 6 or 9 oz. selvage cloth against the upper and lower internal surfaces (which have been sanded to increase adhesion). This cloth should be "U"-shaped and overlap the damaged area by 20% on

all edges. When this is dry, use a thick mixture of micro-balloons and bonding epoxy (like West 105) to form and shape a leading edge. Sand carefully when hard. (See **Diagram # 3.**)

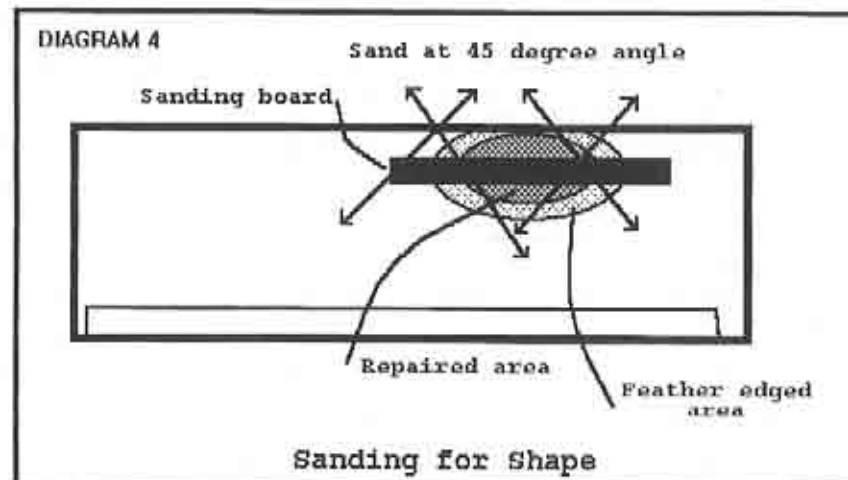
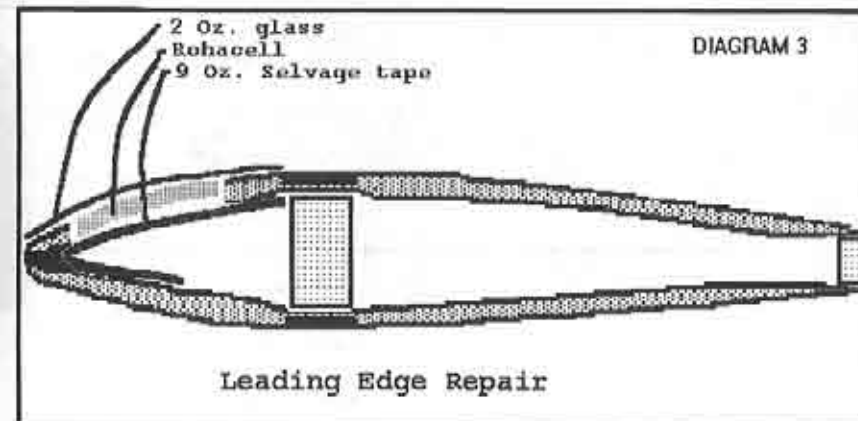
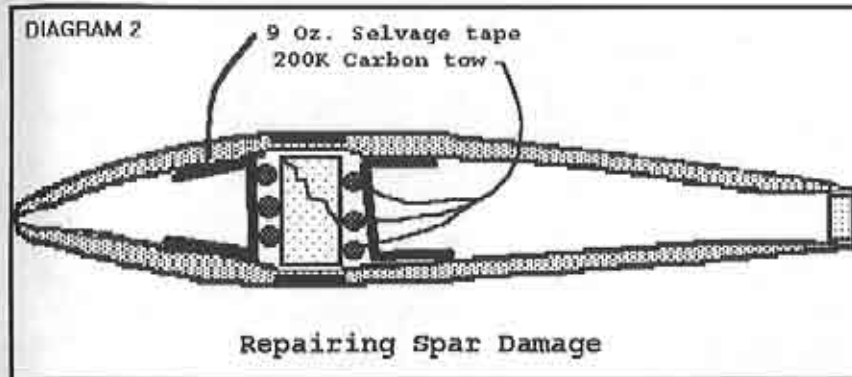
2) FIX DELAMINATIONS. Use thin foam friendly CA on the rohacell to re-attach it to the internal layer of glass. (You can use regular CA if there is no blue foam near the repair.) Poke or drill many small holes into rohacell to assist penetration and aid bonding. A trim covering iron can be used to slowly "unwrinkle" puckered wing skin gelcoated fiberglass (from which the rohacell has been removed).

If the surface skin feels "loose", it is probably not attached to the rohacell underneath. Drill a series of small holes and inject the CA into the holes and flex the skin like an oil can to help suck in the CA. This should bond the two layers of outer skin and rohacell. If the holes are carefully drilled through the rohacell to the lower glass layer, it will also be bonded.

Broken or cracked fibre glass will be "over layered" or removed based on your judgment of the severity and the ease of repair. Once you've repaired all possible delaminations, cut away any remaining loose material.

3) BUILD UP THE EXTERNAL STRUCTURE AND REGAIN THE AIRFOIL SHAPE. After you have repaired structural damage and delaminations, it is time to replace what could not be repaired. Size a piece of 9 oz. selvage tape to fit through the hole and overlap on the inside by 20%. Cut a piece of rohacell to exactly fit in the "window". Tracing paper is helpful here.

When you are comfortable with the fit, "sneak" the U-shaped glass into the hole and into position. (Don't forget the hint about doing "dry runs"! It is especially important at this phase.) Wet the glass with epoxy, using the dowel and brush, and lay the rohacell in place and tape securely with masking tape. A slurry of Cab-o-Sil and epoxy on the rohacell will aid adhesion to the selvage tape. Try to keep the rohacell a "hair" above the surface of the airfoil so that it can be sanded down to shape. Let this dry and sand to airfoil shape



using the surrounding wing as a guide for your sanding board. When you get to the "sanding for shape" phase, use sanding blocks or "long boards" that are at least 30% larger than the repaired area. This will help keep the airfoil smooth and true. Sand at a 45-

degree angle to the spar. (See **Diagram # 4.**)

Feather sand the edge of good wing area next to the repair about .005 - .007 in. as you will lay a 2 oz. layer of glass over the rohacell as a finish surface.

4) **FILL AND FINAL SHAPE.** Using a resin like West 105, which is sandable, lay the final coat of 2 oz. glass over the repaired area. Add a second coat of epoxy to fill and build up the surface slightly. You don't want to sand through the glass.

When the epoxy is dry, block sand with wet/dry 220 - 280 grit. Use Bondo or lacquer/spot putty to fill holes and sand smooth.

5) **PAINT AND FINISH.** Paint with Hobby Poxy or K & B epoxy paint. When this is dry, block sand with a rubber pad and 600 grit wet/dry with water. Finish polish with rubbing compound. Don't worry about colors matching until the wing has spent some time in the sun where UV light will change the color.

YOU ARE DONE! CHECK YOUR CG! PSYCH UP! Go fly!

Perspective

...by Jim Thomas
Woodinville, Washington

This morning, July 17th, I was talking to one of my flying buddies, Troy Lawicki, getting caught up on what is going on in Michigan soaring. After having lived in the area for eight and a half years, I count a great number of friends and fellow fliers that I like to keep tabs on and visit when possible. The recent Mid-South contest in Huntsville, Alabama, that I was able to attend, presented one of those opportunities. The LSF NATS in August will be another opportunity to renew friendships.

To my great sadness, Troy told me that one of our friends, a great flier, ferocious competitor, and all around wonderful person, had passed away. Earle Latimer will be missed not only by the locals in Michigan, but by the numerous others that had the opportunity to know this wonderful guy.

Aside from affecting me personally for the loss of a friend that I won't be able to see or compete with or against, again, this brought to mind something I heard at the Mid-South meet. As RCSD readers know, Fred Rettig (Cornfed to the faithful) is a southerner who competes all over the country, and

Final Notes

We have tried to cover all of the important points in outlining this repair. Obviously every repair is different and you may find new and creative ways to damage your glider. Use this as a guide, but you may have to modify the techniques to fit your circumstances. The most important thing is don't be afraid to try. RnR's molded wings and fuselages are incredibly strong, and actually relatively easy to repair. Look out oak trees! I'm going to go fly my Genesis right now!

Some of the diagrams may not reproduce as well as we'd like. If you would like a full size copy of this article with diagrams, send a STAMPED (at least 2 stamps), self-addressed envelope to Don Whiteside c/o Diablo Valley Soaring Society, P.O. Box 743, Pleasanton, CA 94566. Have fun! ■

always takes the time to chew the fat with anyone who wants a minute of his time. The Mid-South was in his backyard.

Fred was at the Mid-South for Saturday, but was called home due to an illness in the family. Fred showed up at the field before Sunday's competition began, and delivered an invocation and prayer before he left for home. He made the very salient point that we must keep perspective in our lives, and recognize those things that are truly important as opposed to those that we assign more importance to than they truly deserve.

I now more than ever see just what he was talking about. When I think of Earle, I first remember the warm and friendly man who greeted his friends with a big bear-hug. Then I remember the fierce battles to see who would be top dog at so many contests over the years. It seems that no matter who won those battles, Earle was always glad for the victor, whether it was him, or not.

Remember that the camaraderie and friendships that we develop through the hobby are really the most important things, and not who can fly better, launch higher, max a task more consistently, or whatever. ■

An Old Friend

...by Daniel Fulmer
2495 27th Ave.
San Francisco, California 94116
(415) 731-1063



Dynafly Freedom in 3rd and final phase with flaps down. Favorite soaring site 200' above the Blue Pacific. May, 1995

This is a story about an airplane that just doesn't know when to call it quits. The journey began sometime in the late eighties after I had built an Oly 2 meter polyhedral. After many rebuilds and flying time, I decided to try my hand at aileron control flying. Liking aesthetic pleasing lines and being familiar with balsa open bay construction methods, led me to purchase a Dynafly Freedom 72" span slope plane. My more knowledgeable friends advised me to try my hand at something that could take a little more punishment from the numerous shunts that could be expected resulting from my limited flying skills. Eschewing their advice, I pressed forward with my plan to have a good looking ship on the ground as well as in the air. Well, needless to say, on the ground or into the ground it went, but that is getting ahead of the story.

For those who are not familiar with the Freedom, it is not a simple model to construct. From its full flying stab to its flap/airbrake arrangement to its turned up Hoerner tips and rounded balsa fuselage, this plane requires a considerable investment in time and building skills put forth to prepare for flight. The end result however is

stunning when airborne. With its distinctive swept back wing and tail feathers with transparent green monokote covering, I think the plane is one of the most graceful slope ships to ply the cliffs overlooking the blue Pacific. And ply the cliffs it did for about three weeks until a massive input of pilot brain lock led the beautiful machine into a spiral death dive from about 150'. Major lesson to be learned here was to have the bottom of the plane a different color from the top so as not to confuse the pilot with orientation in the sky. The lesson learned was to achieve proficiency flying a plane that was more damage resistant and easier to repair.

As I contemplated how the first major rebuild would be approached, I purchased an inexpensive, easy to repair, ugly, aileron plane and learned how to fly. The rebuilding of the Freedom was planned around certain areas concerning the flying characteristics and orientation problems when airborne. The first concern was a somewhat abrupt tip stall due to a 12" root cord to a 6" tip with a large amount of rear sweep. This problem was met by cutting in tip slots of about 4" span near the outboard ends of the

wing. More on these later. No yaw control and a seemingly lack of authoritative yaw stability at certain speeds warranted the addition of a rudder, thereby increasing the total vertical fin area to combat the short tail moment. The mushy torque rods that actuated the ailerons and quasi-flap/speedbrakes were eliminated in favor of a direct drive servo for each surface (4) with the control horns on the bottom. The wing was opened up to be repaired and ballast tubes were laid in to facilitate penetration in higher winds. A basic 4 channel radio was still used for control. The plane was finished with black bottom surface with white, blue and fluorescent orange on top to correct airborne orientation problems.

After a few months of experience flying and rebuilding, I was ready to send the Freedom out for trials. I was worried about the extra ounces put on during rebuilding. At a stock weight of approx. 48 oz. with 4.5 sq. ft. of wing area the plane was definitely not overweight for the winds in this area. My concerns were unfounded as at 52 oz. she climbed out beautifully and performed admirably in all phases. Low speed gentle wind conditions were handled without difficulty. The annoying tip stall was gone. The plane could be turned much tighter without going into a wing drop as before. Ballasting up to 70 oz. total weight provided a much broader wind range that the plane could now handle. As I fiddled with the C/G and all the other details necessary to dial in a plane, I continued to build and fly other planes. I flew the Freedom in this configuration on and off for about three years, always coming back to it like an old friend. The plane had absolutely no major vices; it flew well at low speed, high speed, low wind, high wind, inverted, and upright flight. It rolled well for a 72" span plane. Inside loops were excellent and outside loops were good, as were snap rolls and spins. Almost effortless would describe how it flew, contrary to some of these huge PSS warbirds with 20 oz. square foot+ wing loadings that I have built. The only shortcoming, if it could be considered that, is that the plane is somewhat lacking in both top speed and energy retention. This was in the back of my mind for a few years and I had a number of ideas concerning improving this area of performance. But I was not about to tear the plane apart to make marginal improvements unless I absolutely had to.

Alas, all good things came to an end, when a receiver battery gremlin reared up and caused the Freedom to come to an untimely end in its second life in a rain threatening south gale. I watched in helpless fascination associated with such events as the agonies of a death dive played out before me. The plane had, I thought, reached that rare plateau where it had achieved more time airborne than it had spent on the building board. This fact sunk in as I picked up the pieces and headed for home reflecting that I had become attached to this plane.

In the following weeks, a plan formed for the 3rd phase of this bird's life consisting of everything I had learned from flying, building, reading and talking to knowledgeable friends over the last 5 years. Incorporating all of the latest techno ideas I could garner, I stripped the Freedom down to its bare bones once again to prepare for major open heart surgery. The streamlining of the fuselage/wing and hatch joining areas was attacked with microballoons and farings. With the addition of fiberglass over the whole fuselage to strengthen and protect, a jet black epoxy paint was applied to finish the fuse on the outside. Inside the fuse, another ballast compartment was added over the C/G, enabling the total amount of ballast added to be able to approximately double the weight of the plane. Also inside, the sullivan tubes that actuated the rudder and stab were stiffened by the addition of epoxied wire inside the inner tube. This virtually eliminated any possible play in this critical control surface area. I highly recommend this method of control slop elimination for this type of setup if already installed in a plane. Moving to the wing, the servo arms were positioned on top of the wing to forestall the nagging problem of stripping servo gears landing in rough areas. The leading edge of the wing was rounded to eliminate the very sharp edge of the original plans. The flap and speedbrake arrangement was changed to a straight flap inboard of the ailerons to allow more lift and rolling ability when actuated by a planned computer radio in the future. The tip slots mentioned earlier were modified to span 5 1/2" and redone to conform to a NACA formula to cut drag and increase efficiency. The wing attachment method was changed from the stock steel pins to a more easily repairable nylon shear bolt arrangement

that allows the wing to ride up on a chamfered fuselage ramp in the event of a major mishap. A more efficient control surface gap sealing method was also incorporated. A brand new monokote covering was added with the same color scheme as before.

You might think an all balsa plane with built up "D" tubed open bay wing cannot possibly be on par with these carbon/kevlar/vacuum bagged rocket ships on the slopes and you are probably right. I don't even know the exact coordinates or even what name the airfoil goes by. It was never mentioned in the plans nor does anyone I know seem to have that information. The foil seems to be about 9%-10% thick with slightly more curve on its top surface than on its bottom surface. But the wing has an excellent ability to float, penetrate and fly inverted. It is not super fast, but it is by no means a slow draggy slug either. The wings light tapered tips make rudder and rolling maneuvers effective. I guess what I'm trying to say is that speed and roll rate are not the only characteristics to be concerned with. Also, as opposed to most pivot wing planes that can only be brought home (in a box) when landing in tight places at high speed with great risk to the plane's structural integrity, the Freedom can be brought down even when heavily ballasted by the use of flaps and/or crow and rudder crabbing, with tip slots preventing tip drop down to very low flying speeds.

Out to the slope I went, armed with the plane in its 3rd stage development battle dress. How would all these new fangled ideas come together? In a 10-15 MPH west breeze I hurled her out. The plane seemed to hang in the air, refusing to fall off even at the extreme upper limits of the lift band. It has an uncanny light air ability even though it is approx. 6 oz. heavier than when first built! It is rock steady in all phases of flight at all ballasted weights up to 24 oz./sq. ft. wing loadings. There is no flutter observed even when flown in 40 MPH+ winds. This I feel is due primarily to the direct drive to servo attachment of the ailerons and flaps and the rigid connection of elevator and rudder to their respective servos. Inverted loops are very good with the only noticeable problem being a tendency to tip stall when flown too slowly when inverted (no worse than

upright as first built). The tip slots do not work when inverted but do not hurt inverted performance like washout does. The plane, as flown in its 3rd phase, seems to have much more energy retention than when stock. It appears to slip through the air and hardly makes any noise when whooshing by at high speed. The computer radio added to my arsenal allows me to take full advantage of all six servos and control surfaces to suit any and all conditions. The plane, as now configured, does all the required movements upright and inverted to be considered fully aerobatic. The full flying stab, thought by many to be inadequate on aerobatic planes, has worked perfectly and in fact is the only part on the plane that has not been modified in any way. I have fiddled with the C/G and weight juggling internally, to be flying at present with no added weight (LEAD!!) in either the nose or tail. If one can get the mass of the plane centered around the C/G, it makes even a medium size plane such as this quite responsive to the slightest control input. The elevator and C/G are set to fly inverted with but a couple of clicks of down, yet the plane has no tendency to tuck during high altitude high speed dives due partly, I feel, to the stiff torsional rigidity of the strongly tapered wing.

The experiment with this old friend has spanned a few years and taught me some valuable lessons and tricks along the way. One of the lessons learned is to take an existing design you are fond of that flies fairly well and tailor it to suit your personal tastes by experimenting with different ideas and looks until you get it just right. This means a large commitment of time for rebuilding and experimental flying. The rewards for such an endeavor of time and effort are a plane that not only flies superbly but also looks striking in the air as well as sitting on the deck. Don't be afraid to incorporate your own ideas into the planes you fly. You will quickly find out if they work or not. If not, just change them back or try something new. The whole object of these projects is to learn and have fun building and flying. This old Freedom has taught me more about flying and building than all the other planes I have, in total. It undoubtedly has a few more tricks to show me; I think I will keep it in flying shape awhile longer. ■

Classified Advertising Policy

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

Personal ads are ran 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: Alcyone, Anthem, Genesis, Mako, 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.

Ford long shaft motors, new shafts, brushes, commutators, and hi-torque windings. Polyurethane paint and custom fitted bushing, or "Real Balls" end plates. Complete, contest duty winches. Turn arounds with lo-mass hubs. Foot pedals, solenoids, line, swivels, switches, plugs, etc. Contact Mike Wade, Wade Supply Co., 17441 N Nunneley, Clinton TWP, MI 48036; (810) 228-9695.

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.

"BIGGUNS", a video on Giant RC Scale sailplanes in flight. Starring the very well-developed 7M GROB 103; co-starring the all-glass, very robust, 7M TWIN ASTIR. Includes an extensive supporting cast ranging from an 8M all-glass LS-4 to a multi-colored 5" MASH-18. Send \$25 plus \$2.50 S&H to Mark Foster, 1738 Hanscom Dr., So. Pasadena, CA 91030.

A.M.A.P. Aerial Model Products, sport, slope, race prototypes - all airfoils. 60' Del Valle Snake, 94" H&K Cobra, AMAP Flair, Kevin Cutler's full house Davenport Monitor. All race tested. Hal Kramer, (510) 449-0441, eve, California.

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For Sale - Business

"REAL BALLS" Ball Bearing endplates for Ford longshaft starter motors. \$120.00/set + \$5.00 ship. Coming soon! Top quality F3J reel and pulley set, ultimate sanding bar. NEW ADDRESS: Douglass Boyd, 29918 SE Davis Rd., Estacada, OR 97023; (503) 630-4451, (503) 630-3515 msg.

For Sale - Personal

Viking Models 1/4 scale Libelle, highly detailed, retract included, airfoil modified to RG-15, all servos included... \$650.00; SG-38 Vintage Scale Primary glider, all servos included... \$550.00; 5 ch PCM Futaba transmitter & receiver... \$140.00. Models are in good quality condition and completely ready to fly. Mark Foster, (213) 257-4573, PST, after 5 pm or weekends, California.

Two MAKO & two STILETTO, your choice @ \$275.00 each + S&H. Call for details. Dale King, (214) 475-8093, Texas.

Custom built 1/4 scale ASW-20, 1995 WRAMS Show trophy winner, built from a Terry Luckenbach kit, full scale cockpit detail and scale documentation, includes wing servos, prototype has won first and second place in the Nationals, outstanding performance... \$850.00. Sal Iasilli, (516) 922-7432, after 6 pm, EST, New York.

NIB 118" Graupner CIRRUS. Aileron inst. on plan sheet, metal power pod and English instruction booklet included. Asking \$250.00 or best offer. N. Christopher Knowles, (402) 330-5335, Nebraska.

Falcon 880, totally rebuilt after accident, new SD3021, obechi/carbon/foam/finished & painted wings, new tail surfaces, all new fuselage refinish and paint, almost ready to fly. Add servos, radio and pushrods, and balance... \$350.00 includes shipping. Paul Bell, (516) 981-1227, New York.

SAMURAI, Sig Slope NIB... \$120.00; MMIRAGE, H. Flight kit, 100", NIB... \$75.00; Mike McIntyre, (815) 436-2744, Illinois.

Airtronics 600 Infinity transmitter, receiver & charger, ch 28 PCM... \$200.00 includes shipping. Sam, (502) 358-2227, eve, Kentucky.

Mueller Comet 89A, 3 piece wing, never flown, 6 new servos (141's & 102's), install receiver, balance and fly... \$650.00; Multiplex Fiesta SF w/servos, RTF, great condition... \$200.00; German Whisper 100" V-tail, fast, obechi... \$200.00; INT'L Sailplanes Sitar Special 100", NIB... \$200.00; Spectrum, NIB w/sharks tooth nose cone & original nose cone... \$250.00; Alpina Magic, NIB... \$400.00. Molds for all composite 2 - meter 'Yahoo' sailplane, Selig 3021 - 3014 slip-on N.C., etc... Best Offer. Ron Carter, (801) 298-0406 (wks), (801) 298-2139 (hm), Utah.

R/C Soaring Digest

Thermal Eagle, custom order kit by Mark Allen with extra carbon fiber in the wings. This ACFT has placed in six contests entered since the fall of 94. No servos, but includes a 900 ma battery pack and fairings for servo arms. SD 8000 wings with black BTMS, red canopy, and no paint on fuselage... \$275.00 plus shipping. Jay Fullinwider, eve, (303) 973-6436, Colorado.

"CARAT" unlimited thermal duration 3.2 meter glider, obechi wings with factory installed and shaped leading edges, root ribs, wing tips, and spoilers. Ailerons are cut out, stripped w/bass wood and completely finished. T-tail and rudder are balsa over foam and 100% finished. All wood has been final sanded with 320 paper and ready to cover or paint. The fuse is typical Hans Kraus German perfection, white gelcoat w/wing rods installed. Kit is NIB with both metal and epoxy glass 10mm wing rods and all hardware before the dollar fell against the mark. Sold for \$475.00, will take \$300.00 plus shipping. Jay Fullinwider, eve, (303) 973-6436, Colorado.

High performance and scale sailplanes. Original Synergy III w/6 Airtronics servos, excellent slope racer or first F3B ship... \$390.00 or \$225.00 without servos; Synergy 91 wings and tail with custom (IL) EAGLE fuselage (like an Eagle fuselage but 3" longer and 1/4" wider), all components in immaculate condition, includes 5/8" rectangular carbon joiner, four 141 Airtronics servos in wings... \$525.00 for all or \$435.00 for wings and stab only; very rare Southern Sailplanes 2 - meter slope Ricochet, beautiful, won the IMS Show beauty contest twice, flies better than it looks, selling with 6 Airtronics servos and 1200 mAh battery, includes fuselage stand and custom wing and stab bags, immaculate, must be seen and flown to be fully appreciated... \$750.00. Quarter scale Robers Discus with no servos, needs some cosmetic TLC... \$350.00. Fifth scale Multiplex ASW-22 with Alpina Magic wings, beautiful model, 100% air ready and flies great, set-up for slope, winch or aero-tow launching, includes 9 Airtronics servos, Graupner retract, custom wing bags, plug-in wing tips for standard 13' or 15' 4" scale wing span option, requires computer radio to operate full-house rudder, elevator, ailerons, flaps, spoilers, retract and aero-tow release functions... will sell with everything... \$795.00. Steve Condon, (619) 630-2909 (H), (619) 594-7823 (W), California.

NIB kits: Legionnaire 140... \$200.00; Airtronics Grand Exprit... \$200.00; Bob Smith Sundancer II... \$100.00; Esteem 110... \$280.00; Airtronics Legend... \$150.00; Airtronics Thermal Eagle... \$300.00; NIB, never used, never charged, Vision 8SP 3.0 Program... \$589.00. Prices do not include shipping. Tom Gressman, (303) 979-8073, Colorado.

August 1995

1/3 Club Libelle (Krause), 5 meter span with servos rigged for Futaba with nose release, absolutely ready to fly... \$1400.00; Twin Astir (Wik), 4 meter all glass, excellent condition, completely finished, ready to fly, slight hangar rash, has an immaculate detailed twin cockpit, competition worthy, all servos rigged for Futaba radio, nose tow release for airtowing... \$1000.00; Thermoflug all glass 4 meter Salto with Futaba servos, slight hangar rash, absolutely ready to fly... \$900.00; 6 meter Nimbus 2 with flaps, spoilers, airtow and all servos, ready to fly, mint condition... \$1500.00; Wik Twin Astir, all glass, NIB, 3.8 meters... \$495.00; Multiplex 1/4 DG-300, all glass (wing section FX 60-126), NIB... \$595.00; Multiplex 1/4 Ka6E, 4 meters, NIB... \$495.00. Robin Lehman, (212) 879-1634, New York.

Diamond (molded) 96", RTF less receiver... \$500.00 + S&H; Mako 114", 7037, Air 141 servos (2), IIS 80 mg's in wing (4), custom carrying case... \$550.00 + S&H; Laser by Bob Sealy (ARF) 124", 1110 sq. in., 62 oz. (8 oz. wing loading)... \$185.00 + S&H less electrics. Paul Ikona, California Soaring Products, (818) 966-7215, California.

Mako V-tail (7037), JR 341's (4), HiTec HS 80's (2) in tail, RTF, less receiver... \$425.00 + S&H. Curt Nelring or Paul Ikona, c/o California Soaring Products, (818) 966-7215, California.

RnR Genesis, 7037, thermal duration, all molded sailplane, excellent condition (see RCSD 8/95 for repair history), four Airtronics 141's in wing, two ball bearing std. servos in fuse, SR 700ma battery, Futaba connector harness, easily converted, flies great... \$500.00 or best offer; Birdworks' Rubber Duck, two std. servos, 500ma battery... \$50.00. Don Whiteside, (510) 227-3321 or e-mail dwhiteside@aol.com.

ASH-25 by Robbe, NIB, 3 - 3.6 meter span w/ plug in wingtip extensions, obechi covered wings w/spoiler slots pre-cut, Plura fuse... \$275.00. John Derstine, (717) 596-2392, Pennsylvania.

Wanted

GOOD Thermal Sniffer for cross country flying. Call Bob Sowder, (901) 751-7252, Tennessee.

Lorus or Seiko countdown stopwatch in good condition for use in F3B and other soaring activities. If you have one you would sell for a fair price, call Steve Condon, (619) 630-2909 (H), (619) 594-7823 (W), California.

2M Sonic fuselage. Any condition, Gordon Jones, (214) 271-5334, Texas.

Right wing or both wings for Multiplex LS-3. Gerald Fukuoka, Johnston Atoll, P.O. Box 049, APO/AP 96558.

Left wing for Multiplex DG-300 or 300/17 (obechi). Will consider entire kit, NIB, or damaged plane. John Derstine, (717) 596-2392, Pennsylvania.

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Wanted

Gliders: old, wood scale or modern, Baby Bowlus or Albatross, Nelson Ka6, Minimoa or Primary, Synergy 91, F3B and F3B types. Wings: Multiplex, DG-600 (end feathers), DG-300, 100" or 130" (carbon fiber), Hobe Hawk [tail feathers - I have a right wing if anyone needs it.]. JR receivers and crystals, stuff - anything. I restore old wooden gliders and just can't stand to see anything thrown away! If you have something that you are going to throw away, please call me first. I'll work with you, on a trade or whatever. Gene, (805) 527-8582, California.

Left wing for Multiplex Ka6e, or a pair of wings. Ron Wahl, (315) 331-7417, NY.

Vision 85P, well cared for, reasonably priced, with or without servos, etc. Any channel. Michael @ (206) 631-8269, 9am - 9 pm, Washington.



ZIKA

New Product

Mystery Ship

...by Jim Gray
Payson, Arizona

Soaring guys and gals, watch out for a new kit on the block. The Mystery Ship is designed by Bob Martin, of Major Hobby, who also designed the Bobcat and the Talon.

What's so special about the Mystery Ship? Well, for starters, it has a SD7037 airfoil on a 118" wing span. It is all wood with laser-cut parts of extraordinary accuracy and fit, and it sports a sexy T-tail!

So far, pretty tame, you say? Well, dig this: a few have already been flown... And you might call 'em 'Beta Test' machines. Bob tells me that the owners are impressed! They're intended to be excellent thermal machines, fast when loaded up, with flaps, ailerons, rudder, elevator — the works! And, they're ideal for your computer radio.

There is an ad in *RCSD* this month which provides additional details on the Mystery Ship, and within a month or two there will be a review by Dave Wenzlick, one of the Central Arizona Soaring League's top builders and fliers. He'll tell you about his experiences with the kit and its parts, the way it goes together (Laser-cut parts fall out of their matrices, and I know

'cause I had Dave's kit opened up on my bench.), how it soars, and how it compares with Blackhawk, that carbon super-soarer of Ray Olsen's, who is also a CASL member. Of course, if you buy your own Mystery Ship now, you won't have to wait for Dave's review, and will be able to find out for yourself!

Okay, the piece de resistance is its introductory price of \$149.95 (which includes shipping in the continental U.S.). And, for a limited time, *RCSD* readers can save \$5.00 more.

Sure, I know it's a builder's kit, and a lot of you folks don't build anymore, but for those who love the workbench, and loathe ARF's, why not try out a Mystery Ship. It could be your next sport and contest machine all wrapped up in one very elegant design package.

The Mystery Ship is available through selected dealers.

Major Hobby
1520 - B Corona Drive
Lake Havasu City, AZ 86403
(520) 855-7901



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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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
Route 1, Box 239
Lovettsville, VA 22080

T.W.I.T.T.

(The Wing Is The Thing)

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

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

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

Special Interest
Groups & Contacts

R/C Soaring Resources

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

Contacts & Soaring Groups - U.S.A.

Alabama - North Alabama Silent Flyers, Ron Swinehart, 8733 Edgehill Dr. SE, Huntsville, AL 35802; (205) 883-7831.

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!

California - California Slope Racers, John Dvorak, 1063 Glen Echo Ave., San Jose, CA 95125; (408) 259-4205.

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

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

California - South Bay Soaring Society, Mike Gervais, P.O. Box 2012, Sunnyvale, CA 94087; (408) 683-4140 after 5:00 pm.

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: F-Flyer@ix.netcom.com.

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

Florida - Florida Soaring Society, Ray Alonzo (President), 3903 Blue Maidencane Pl., Valrico, FL 33594; (813) 654-3075 H, (813) 681-1122 W.

Georgia - North Atlanta Soaring Association, Tim Foster, (404) 978-9498 or Tom Long, (404) 449-1968 (anytime).

Hawaii - Maui Island Slope Soaring Operation, Gerald Fukuoka, Johnston Atoll, P.O. Box 049, APO/AP 96558.

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

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), RR#3 Box 569, Gorham, ME 04038; (207) 929-6639. InterNet e-mail <Jim.Armstrong@acornbbs.com>.

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

Maryland and Northern Virginia - Capital Area Soaring Association (MD, DC, and 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.

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.

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

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

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

Ohio - Dayton Area Thermal Soarers (D.A.R.T.S.), Walt Schmoll, 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, or e-mail tomnagel@freenet.columbus.oh.us.

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

Tennessee - Memphis Area Soaring Society, Bob Sowder (contact), 1489 Wood Trail Circle, Cordova, TN 38018, (901) 757-5536, FAX (901) 758-1842.

Texas - Texas Soaring Conference (Texas, Oklahoma, New Mexico, Louisiana, Arkansas), Gordon Jones, 214 Sunflower Drive, Garland, Tx 75041; (214) 271-5334.

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

Virginia - Tidewater Model Soaring Society, Herk Stokely, (804) 428-8062, email: 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) 371-0659.

Canada - Manitoba, Winnipeg MAAC Men Gliding Club, Bob Clare, 177 Tait Ave., Winnipeg, MB, R2V 0K4, Canada, (204) 334-0248.

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

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

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

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

BBS/Internet

BBS: SI.OPTECH, Southern California; (714) 525-7932, 14.4 baud - 8-N-1

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

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.



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October 21
 2M in Morning
 Open in Afternoon

October 22
 Handlaunch
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Reference Material

"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 "SoarTech" publications, also. Contact: Herk Stokely, 1504 N. Horseshoe Cir., Virginia Beach, VA 23451. Phone (804) 428-8062, email: herkstok@aol.com.

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.

Schedule of Special Events

Date	Event	Location	Contact
Aug. 18	Dawn-to-Dusk Challenge	Everywhere -	Jimmy Prouty, prouty@emh.kadena.af.mil
Aug. 19	Handlaunch	San Antonio, TX	Jerry Caldwell, (210) 438-4077
Aug. 19	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Aug. 19-20	SBSS Summer Classic	Gilroy, CA	Scott Meader, (408) 244-2368
Aug. 20	SOAR Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
Aug. 20	MATS ORCC Duel	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Aug. 27	Slope Soaring	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Sept. 2	SASS HL 2	Redmond, WA	Joseph Conrad, (206) 630-2670
Sept. 9	TPG HLG Contest	Poway, CA	Art Markiewicz, (619) 753-3002
Sept. 9	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Sept. 9-10	13th CASA Open	Gaithersburg, MD	Steven Lorentz, (301) 845-4386
Sept. 10	Grand National Nostalgia	Rochester, MI	Jack Lafret, (810) 694-2490
Sept. 10	7th Annual Coteau Station, Canada	Station, Canada	Dan Gregory, (514) 684-1795
Sept. 10	2M & Open	Dallas, TX	Tom Peadar, (214) 644-6131
Sept. 16	2M/Open	San Antonio, TX	Gene Warner, (210) 732-3101
Sept. 16	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Sept. 17	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Sept. 17	SOAR Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
Sept. 17	Team Duration	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Sept. 23	MARCS F3J	Madison, WI	Al Scidmore, (608) 271-5500
Sept. 23-24	Astro Champs	Fountain Valley, CA	John Raley, (714) 641-1776
Sept. 23-24	2m & Open	Orlando, FL	Hank McDaniel, (407) 831-3688
Sept. 23-24	Last Fling of Summer	Tulsa, OK	Mike Teague, (918) 747-1245
Sept. 24	F3J	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Oct. 1	Great Pumpkin	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Oct. 7	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Oct. 7-8	Fall Soaring Festival	Visalia, CA	
	Western States Triad		
Oct. 7-8	SOAR Fun Fly	Plainfield, IL	See Illinois R/C Soaring Contacts
Oct. 14	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Oct. 14	TPG Unfld. Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Oct. 15	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Oct. 15	Open	Dallas, TX	Jim Truitt, (214) 348-2929
Oct. 14-15	Fall Soaring Tournament	Memphis, TN	Bob Sowder, (901) 757-5536
Oct. 14-15	2m & Unfld.	Morrilton, FL	Frank Strommer, (813) 844-7225
Oct. 15/18	Slope Soaring	Cape Cod	Alex Wenzl, (514) 984-7957
Oct. 21-22	Canyon Lake Classic	Canyon Lake, TX	Greg Dickerson, (210) 656-1796
	2M, Open, HL - Potters Creek Park		Tom Meeks, (210) 590-3139
Oct. 21-22	Pensacola Contest	Pensacola, FL	Cornfed, (334) 660-1318
Oct. 21	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Oct. 22	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Oct. 22	SOAR Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
Oct. 29	One Design Contest	Orlando, FL	Rick Eckel, (407) 365-9757
Nov. 4-5	2m & Unfld.	Morrilton, FL	Ken Goodwin, (904) 528-3744
Nov. 4	TPG HLG Contest	Poway, CA	Art Markiewicz, (619) 753-3002
Nov. 5	TPG Fun-Fly & BBQ	Poway, CA	Steve Stricklett, (619) 741-1037
Nov. 5	SOAR Turkey Shoot	Plainfield, IL	See Illinois R/C Soaring Contacts
Nov. 11	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Nov. 12	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Nov. 12	Open	Dallas, TX	Chuck Fisher, (214) 270-2634
Nov. 19	Open	San Antonio, TX	Perry Van, (210) 658-8842
Nov. 24-26	22nd Tangerine	Orlando, FL	Ed White, (407) 321-1863
Dec. 9	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Dec. 10	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Dec. 9-10	Winter Soaring Festival	Indio, CA	Buzz Waltz, (619) 327-1775

Special Events

TIDBITS & BITS

Canyon Lake Classic

The following was sent in by the Heart of Texas Soaring Society.

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The contest announcement containing more details is included in this issue.

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We have received numerous calls, notes, and letters asking for help finding suppliers of winches, and line retrievals systems, in particular. If any of you are a manufacturer or a distributor and your products are readily available, please contact us. If you are a reader that is aware of someone who manufactures winches or retrievers, please ask them to contact us. To date, the only known, available systems that we are aware of, are available from Rahm in Southern California at (310) 866-2405. Thanks in advance for any help you can give us! ■

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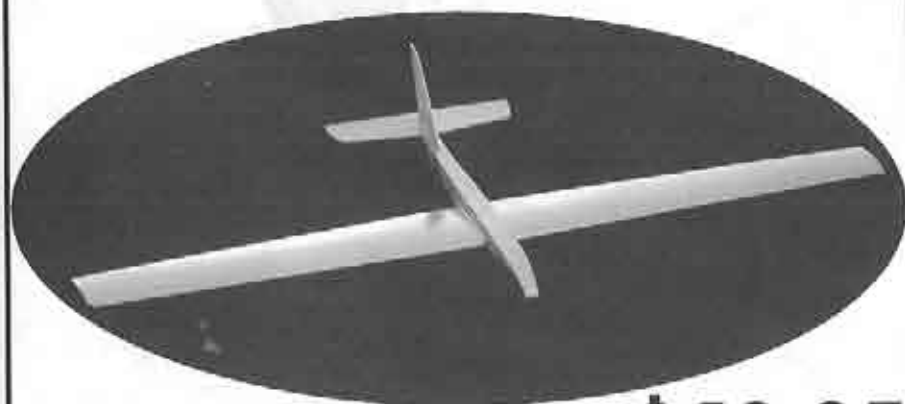
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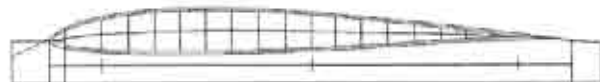
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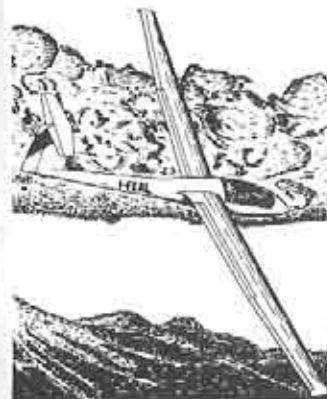
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3.0 oz	38"	satin	5 yds +	\$2.95/yd
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Fuselage Length 54 inches
Wing Area 840 Square inches
Stabilizer Area 104 Sq. inches
Aspect Ratio 14.6:1
Maximum Ballast 8 Ounces



ESTEEM 121

Span 121 inches
Airfoil SD7060 Modified
Wing Loading 9.2 Oz/Sq.Ft.
Wing/Stub Pre-sheathed obeche over foam
Weight 55-58 Ounces
Fuselage Length 54 inches
Wing Area 1005 Square inches
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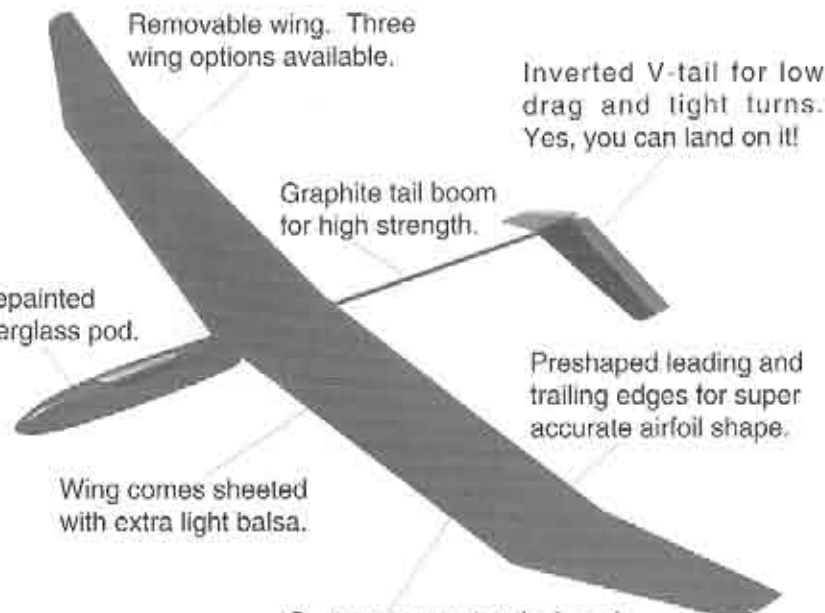
Span 78.9 inches
Airfoil SD7084 Non Modified
Wing Loading 8.40z/Sq.Ft.
Wing/Stub Pre-sheathed obeche over foam
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Production is limited. Full payment will lock in this low price and get you a delivery date. First delivery is projected for 1 Aug '95. You may cancel at any time.

SPECIFICATIONS

Wing Span = 59 in

Wing Area = 328 sq in

Weight = 11 oz approx.

Wing Loading = 4.8 oz/sq ft

Radio = Micro w/V-tail mix

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If you fly in a high lift area and are willing to settle for fewer climbs, the "Turbo Power" systems work very well with smaller light weight cells. These cells can further lower your wing loading, thereby increasing your chances of catching a thermal. We use flying a "Windang" (10 ft. span high performance sailplane) with this system, and while we cannot go vertical the climb rate is very good and in short order we are at altitude. This model has 6 servos matched with a 10 channel JR radio to give variable camber to the wing along with "crow" etc. In windy conditions models of this size are often twisted with lead in amounts equal to the power system. The most surprising thing is that the two and three meter sailplanes hardly notice the power system weight and the larger models often work better with the extra weight!!!

You won't believe how simple the whole system is... 7-10 cell packs can be charged in 15-20 minutes, so with 2 packs you can always have a fresh one "ready to go"!! If you have a quick change battery compartment in your model, turn-around time can be as little as 1 minute from touch-down to launch!!!

What makes up the "Turbo 10" power system? (1) "Turbo 10 Motor" (2) "Superbok" 6.0:1 gear ratio (3) Motor speed controller, FX-35 Digital or Dixon Systems Mini Night Digital. These are micro-processor, state of the art, motor controllers.

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WHAT KIND OF SAILPLANE DO WE SUGGEST?

The Minimax company has designed a model around the "Turbo 10" power system that completely encloses the gearbox, and the spinner gives the front of the model a very aero-dynamic and pleasing look!! It is doubtful that any model will be produced to equal or exceed the super, light wing loading that they have achieved. For sport flying or low-end competition, this is the way to go!! Also, "THE PRICE IS RIGHT." With over 70 oz. of thrust available using the "Turbo 10 Plus" motor, you can launch almost any sailplane with a weight of 8 lbs. or less. The "Turbo 10" power system will fit in nearly any model, but many sailplanes have extremely pointed noses which will require that you cut a small opening in the nose section of the fuselage to let the gearbox protrude through. To pilots, this is not acceptable, but to the pilot who wants super performance with light weight, it can be tolerated. When the model is a few feet away, you can hardly see the gearbox. It is also possible to re-do the nose section to completely cover the machinery. Some of the larger sailplanes have nose sections that are large enough and require no modifications. To match the performance we get on 10 cells with a direct drive motor, would require approximately 20 cells and you would get fewer climbs. We don't feel the trade-off is worth it as we have finished many of these heavy, high powered sailplanes!!

Several months ago we received a call from the "Minimax" company and they were interested in trying our "Turbo 10" power system in their 2 and 3 meter sailplanes. We made a deal!! If the system worked as well as we said it would, the "Minimax" company agreed to offer an electric version of their sailplanes. The system worked as well that in a couple of weeks they began getting all the changes in the computer. You won't believe how well everything is arranged and how aerodynamic the nose is, while completely covering the power system. Not only is this model good looking, but its ability to catch a thermal is better than any powered sailplane we have tried. We are talking wing loadings of 7+ oz. per sq. ft. when using 7 cell 1000 ma packs (2 meter) and 6.1 oz. per sq. ft. when using 1000 ma packs (3 meter)!!

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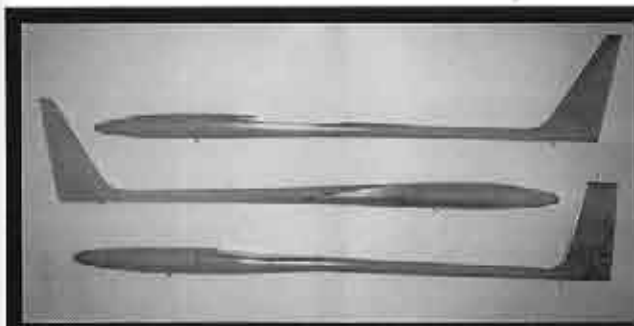
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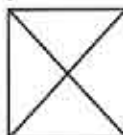
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