

Sky Hawk



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"Red Hot" Sport

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Airfoil - Tip	SD 7037 or S7012 - 8%
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Soaring

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"HEARTBREAK RIDGE"

Photo courtesy of David Steere,
See "About the Cover" on page 3.





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The Soaring Site

About the Cover

Dave Steere, of Oakland, California, sent us this interesting photograph of himself, about to stall his trusty, old Oly 650 gently into his waiting hand. The photo was taken by Dave's flying buddy, Fred Fisher, on the site of Fred's 22-acre home site in Northern California, outside of Vacaville. Dave notes that he and Fred taught themselves how to fly at this hill, which they early on christened "Heart-break Ridge", in painful recognition of their experiences.

Sunburn Alert

We received a note from Gary Fogel of Los Angeles, California. Gary says, "While reading a recent issue of *Nature* magazine (*Nature*, Vol. 371, pg. 291, 1994), I came across an article that I thought would be interesting to your readers. It suggests that cumulus clouds near the sun "can significantly intensify solar UV-B, particularly during summer and when both the sun and cumulus clouds are near the zenith". The report suggests that the increased UV-B at noon was "sufficient to reduce the time required for erythema (reddening) of exposed human skin by at least 15% below that expected under an identical ozone column and a clear day". Although most of their measurements were conducted in Hawaii, they went on to report "similar enhancements of UV-B caused by cumulus clouds were observed in August 1994 at Seguin in south-central Texas, but only on haze-free days".

"Generally, I feel that most R/C pilots operate under the assumption that the more cumulus clouds there are to "block" the sun, the less chance there is at getting a sunburn. Unfortunately, this does not appear to be the case and with spring and

summer fast approaching, perhaps this would be a good time to remember to pack some extra suntan lotion in your tool box (And put it on!) before you go to the field to fly under those lazy, cumulus clouds." Thanks, Gary.

RCS D Index/Database

Lee Murray of Appleton, Wisconsin has been updating the index for RCS D every year. He dropped us a note saying, "The RCS D Index/Database for 1984 - 1994 has been uploaded to Compuserve and should be available in the Modelnet forum files very soon." Thanks, Lee.

T-Shirts

Over the years, several of you have wanted to purchase T-shirts with the RCS D logo design. But we just didn't have the time and energy to devote to doing this sort of thing. Recently, George Voss called and said that he was taking a silk-screening class and asked for permission to do RCS D T-shirts. So, if you're interested, they're \$14.95 + \$3.00 S&H. The address is: George Voss, 1403 Lincolnshire Road, OKC, OK 73159; (405) 692-1122.

A Wish List

Can anyone help? This wish list is from Robert Steinert, Olathe, Kansas.

"Hope a publisher of '95 calendars showing full-size gliders will run an ad in the classified section."

"I wish someone would write a generic article on programming a computer radio transmitter. The article in the December, 1994 issue on programming the X-388S radio is too detailed and dedicated to one brand to be of much use to someone who is still using a simple 4-channel transmitter... It's difficult to get basic information from people at the flying site, which is understandable. You probably have to step on their winch line to get their full attention."

"Another great aid for someone like me who is on the learning curve and shopping around, is to publish in matrix style

a listing of functions used by gliders versus brands of radio transmitters with brief footnotes on how it's performed, say, using buttons, levers, or menus."

From "Bob in Seattle"

Bob Cook of Renton, Washington, has questions, too. He says, "I'm a beginner. I'm on my first plane. I have no real flying experience. I'm building a "Pie-O-Cake", electric powered. So, what should be my second plane??? I'm a 200 hour Cessna pilot, but that won't help me, I'm told. I have a feeling this is going to be a long, slow process. But it should be fun. I just hope I don't crash too much. So, do you have any suggestions for me?"

Well, Bob, a lot of folks are asking the same kinds of questions. There are many such as yourself who call, write notes, or drop by the workshop to get some help or assistance on their project. Just today, for example, we received a call from Houston, Texas from someone that wants to get back into the hobby and teach his 7 year old son how to fly. But, the hobby shops that he has visited in the area can't help or direct him, and they don't sell sailplane stuff. Of course, he is now armed with a couple of phone numbers, and we will be sending him additional information and a copy of RCS D. In your case, you might want to call someone in the Seattle area (see "Resource Section"), if you haven't already done so, and find out where they are flying electric. They can show you what they're flying and give you some ideas on what to build next.

There is a key point here, however, that we want to direct to the readers: Where does one go to learn the basics of construction and flying techniques? This month, Pancho Morris addresses the subject of intimidation at the flying field, and Ed Slegers talks about youth involvement. In Ed's column, Dan Bernauer, the 17 year old secretary for the Seattle Area Soaring Society, explains

why he is able to successfully build and fly planes, and who helped him do it. Bob Sowder, in his column, talks about "Advancing the Hobby".

This month, we sent out approximately 30 copies of the March '94 issue of the *CIAM Flyer*, having received permission from Jack Sile, the new editor. (The *CIAM Flyer* is the newsletter of the FAI Aeromodelling Commission in France.) Since most of you have not seen it, John Konstantakatos' editorial column is shown here in its entirety. One could substitute the word "Junior" for "Novice" or "Beginner", of course. What do you think?

Happy Flying!
Jerry & Judy Slates

Improved Pinless Building Construction Method

...by Alan J. Bialock
Bellevue, Washington

I recently built an Easy Eagle glider from a kit supplied by Ace R/C. The assembly manual describes a pinless method of construction in which CyA and 3M Super 77 spray adhesive are used with waxed paper on a flat, smooth work surface. This method worked very well, but it left the plans difficult to reuse, as Super 77 is sprayed directly on the plans.

Here is an improved method I used to build a set of tail surfaces, which left the plans clean and without pinholes.

Stick the plans to the work surface with Scotch Drafting Tape cat. 172 at several places around the edges. Then apply

EDITORIAL

**A Junior "problem"
or an Adult "solution"?**

- Where are the Juniors?
- Are we the last generation?

Between these two questions that have appeared in the modeling press, there is a time period of many years. It seems that the Junior "problem" is still wandering.

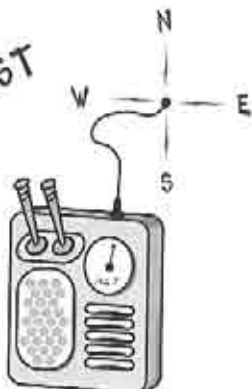
- ⊃ Why are many Juniors not attracted by (or to) the joys of building, fitting and flying model airplanes?
- Have we asked them?
- ⊃ Do they know what aeromodelling is all about?
- Have we told them?
- ⊃ How can Juniors get started in the hobby?
- Have we showed them?
- ⊃ Is it easy for Juniors to compete in aeromodelling events?
- Have we enriched our sporting codes to "customize" Junior competitions?
- ⊃ So, is there an answer?
- There are numerous ways to bring - and keep - more Juniors into this hobby-sport which we believe is the ultimate recreational choice. But first of all WE, the ADULTS, have to take the initiative. Whether this happens on a personal basis, through a local club activity, or at the NAC level, the CIAM is here to support, in every possible way, the efforts of the Junior-minded aeromodellers.

John Konstantakatos

strips of Scotch Double Stick Tape cat. 137 directly on the work surface a short distance from the edges of the plans. Apply thin, clear, plastic sheeting, such as backing from monokote over the plans, to the double stick tape. Lay newspaper on the work surface around the plans to protect them while spraying. Spray a light coat of 3M 77 on the plastic sheeting. Assemble the parts with CyA or other adhesive on the sprayed plastic. It is advisable to finish the assembly of parts over the space of a day or two, as the spray will dry up. The assembly can be removed with a thin steel blade. The plastic is easily separated from the adhesive strips and the strips can easily be pulled up from the work surface. Any spray which might have strayed on the work surface may be removed with paint thinner. ■

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ZIKA

by doing away with sailplane classes (size), and institute SKILL LEVEL classes.

Many groups have done this successfully for years, and the skill level concept is taking a foothold in many other soaring arenas. Face it, technology has evolved to where 2-meter ships are just as competitive as unlimited ships. (Notice there was no mention of Standard Class.)

Advancing the Hobby

OK, we've been cruising along in several articles without getting anyone's feathers ruffled. Safe stuff, but now I'm going to step out on a bit of a limb.

I believe that the time has come for a re-vamping of the AMA rule book in order to attract new blood at sanctioned soaring events. In other words, let's start singing from the same sheet of music by making competition fun for the newcomer and sportflyer!

Many clubs that sponsor AMA sanctioned contests are constantly looking for ways to attract new flyers and more contestants. (Unless, of course you live in Visalia.) The same group of loyal sailplane diehards have remained virtually unchanged year after year. I guess that's why we call ourselves diehards. For me, going to the LSF Nats is like going to a 15 year reunion. I see many of the same people that have been flying in contests for years, and face it gang, we're not getting any younger. Don't misunderstand me. I really enjoy seeing these folks, but an influx of new diehards would be nice to see as well.

So... How do those of us who concern ourselves with such issues go about hooking the new enthusiast or sportflyer into attending and enjoying some friendly competition? You level the playing field

If a newcomer is given the opportunity to compare his or her skill level against other competitors grouped in the same class, suddenly they feel like they've got a shot at doing well. The reason many sailplane flyers don't attend contests is they believe that they just don't have a chance at competing with a reasonable amount of success against seasoned contestants. The second challenge for us is developing a format that provides ample flying opportunities for everyone - another subject.

I beckon you to consider the following basic guidelines for skill level classes that has worked extremely well for us in the Mid-South as well as other regions. We feel that these guidelines for skill level classes has enabled us to attract soaring enthusiasts that would not typically attend an organized soaring meet. I would like to explore the possibility of an AMA rule book amendment that incorporates these fundamental guidelines for defining skill level classes.

EXPERT Class

Definition: Highly seasoned, experienced, proficient

Criteria: Current LSF Level IV or V. Previously placed 1st, 2nd, or 3rd in overall field standings in a sanctioned sailplane contest with 20 or more entries.



The photos are from a couple of old cross country events. There were ten LSF level Vs in attendance at one. We call it "A Gathering of Eagles". The name "Sugarloaf Classic" is taken from the Sugarloaf Mountains of Maryland, which can be seen just to the left of the A-frame... Gus Peleuses

(L - R) Skip Schow, Guy Dikes, Tom Dickey, Don Clark, Pat Flinn (kneeling), Bob Sowder, Jerry Ziegenfuss, Terry Luckenbach, Don Goughnor, Bob Champine

SPORTFLYER Class

Definition: Intermediate to experienced.

Criteria: Current LSF Level II or III. Have never placed in the top three standings in a sanctioned sailplane contest with 20 or more entries.

NOVICE Class

Definition: A beginner needing assistance to fly safely, and is 15 years of age or older.

Criteria: Has yet to join LSF or is currently working on LSF Level I. Has limited, if any contest experience.

JUNIOR Class

Definition: Any junior contestant 14 years of age or younger.

No other criteria.

I feel the time has come to de-emphasize the length of wing spans and emphasize experience level as a way of conducting AMA Sanctioned contests so that we may attract future new diehards. Furthermore, to ignore ways to encourage new people into soaring does not bode well for the long term future of our sport. Competitive flying can be fun, rewarding, and challenging, if we can collectively make it that way.

Your thoughts will be the subject of a future article.

Club of the Month

The Club of the Month feature was submitted by long-time CASA member and newsletter editor, Gus Peleuses.



(L - R) Bob Souder and Guy Dickes when they received their LSF V awards. Although they had completed the program some time before, the awards were made at another of our cross-country events—one of the reasons being that Skip Schow of CASA was President of LSF at the time...

Gus Peleuses

Past and Present CASA Members read like a Who's Who in RC Soaring.

The Capital Area Soaring Association (CASA) is so named because of its proximity to the nation's capital. It caters to RC soaring enthusiasts in Virginia, Maryland, and Pennsylvania. Although CASA has been in existence for some twelve years, its foundations go back much further. Some of you may have heard of DC/RC—it's been around for a long time, has had (and has) many famous members, and it's done some outstanding things. In the late '70's the soaring contingent within DC/RC became so large that it almost turned into the proverbial



(L - R) Skip Schow making the LSF V award presentation, at the same contest, to Charlie Wells. Charlie is one of CASA's founders and guiding lights and he was the one that designed both the cross country course and the cross country contest...

Gus Peleuses

tail wagging the dog.

In October 1982, the soaring group separated from DC/RC and became the Capital Area Soaring Association. The parting was very amicable, in fact, all soaring equipment (winches, returns, batteries, line, frequency control boards, etc.) owned by DC/RC was turned over to newly formed CASA.

CASA has about 100 members. Being soaring enthusiasts (this means most of us are more relaxed than our power brethren), we decided on a relatively relaxed and loose organization. Our command structure is composed of an elected "ad-

visory board" of three members - a treasurer appointed by the advisory board, and a "coordinator" also appointed by the board. The advisory board members serve for two years and their terms are staggered and the coordinator serves for two years. CASA is run by the coordinator who is sort of a "benevolent dictator". He goes to the board only when there is an unusual problem.

We hold monthly competitions - "tournaments" - with three classes of fliers: Expert, Sportflyer, and Novice. New members place themselves in the appropriate category. We keep cumulative annual scores, October through September. The annual winner in Sportflyer is automatically moved into Expert class. Novices move to Sportflyer at the end of a year. Anyone can move themselves up to the next class voluntarily at any time. Monthly awards consist of a CASA pin with a ribbon for 1st, 2nd, and 3rd in each class, and annual awards are plaques down to about 20% of total flyers in each class. Our monthly events draw 30 to 45 contestants every month unless we literally get blown out by weather.

Annually, CASA puts on a 2-meter event which runs two days, but is trophyed each day (i.e., two one-day contests); an Open event, again the same way, and an electric soaring event. Our 2-meter draws 30 to 40, the Open over 90, and the electric 15 to 20. In the past, we also ran an annual cross country race which we have had to put on hold due to the loss of a field. We also run a small, in-house hand launch event - and since most of us can't throw a nickel ten feet, we use a short high start. It really is more accurate to call it a 1.5 meter event. And, we do a lot of weekend and evening sportflying. Although we're competitive, we're also relaxed.

We also support LSF and we have had eight Level V's, numerous IV's, and who knows how many more III's and II's. The

primary reason for holding scheduled monthly events is to provide an opportunity for scoring LSF contest points. The monthly contests also help sharpen the competitive skills of those CASA members who go on the contest circuit.

Currently, we have two primary fields - really picturesque, open country sites - the Manassas battlefield (Civil War) picnic area in Virginia, and a large field in Maryland near the Potomac River which is part of the Potomac Polo Club. In addition, once a year we have access to the National Geographic grounds, a gorgeous square mile of grass in Maryland, for the CASA Open.

We also have a slope soaring site in Maryland which is just for sportflying. And once a year we have our "Cumberland" event in West Virginia which is a two day relaxed slope soar, wine and dine, informal get together. Serious sloping, for Level V efforts is usually done in the Pennsylvania mountains.

For most CASA members, the contest circuit is the Eastern Soaring League, or ESL which has a series of contests sponsored by member clubs. The ESL is a loosely knit consortium of soaring clubs on the east coast which tracks points earned on the ESL circuit and give annual awards.

We have been very fortunate in having a solid core of committed RC soaring enthusiasts who have kept CASA going despite the transient nature of the local community. These include Don Clark who is an AMA Hall of Famer and one of the developers of the Thermal Sniffer along with Ben Givens and Walt Good, an RC pioneer. Skip Schow is a former LSF president, and Chris Bovais an AMA Nats Soaring Scale Champion. And at one time or another, we have numbered among our members Maynard Hill a world record holder, Frank Weston of WACO, Bob Champine who is a double LSF V and AMA Hall of Famer, Woody

Blanchard modeller extraordinaire, former AMA VP and also an AMA Hall of Famer, Ben Clerx of Mako fame, Pete Young editor of the Harbor Soaring Society newsletter, Bill Cavanaugh currently president of the Baltimore Area Soaring Society, and Eric Sanders developer of the CompuFoil airfoil plotting program. (The problem with lists like this is we always leave someone out - and to those, we apologize.)

With this kind of membership and dedication to the hobby we all love, CASA looks forward to supporting RC soaring for at least another twelve years. If you happen to be on the east coast, look us up. Our message line is (301) 933-CASA.

Thanks for the write-up Gus! As a past member, I can report first hand that CASA represents a talented and wonderful group of members. If future travel plans calls for a trip to the Washington, D.C. area, be sure to ring up the CASA message line and catch up with this group.

**...until next month,
Thermals! Bob ■**

Small World Department

(From the August, 1989 issue of CASA Comments)

...by Gus Peleuses
Fairfax, Virginia

I had occasion to call Jim Gray out in Arizona, and as we were chatting, he mentioned he knew some CASA people. I asked who, and he said, Don Clark. Jim went on to relate a pretty funny story. He said he and Don had gotten together at Harris Hill in New York and Jim took Don up for a ride in a full-sized glider. After launch, as they were cruising along, Jim asked Don if he'd like to take the controls, and Don said, "Yes." Jim told me that not only did Don fly very well, but he immediately found lift and they went up to about 4000 feet. Jim said to Don, "You've flown before! Right?" Don said, "No, I haven't." Jim insisted he must have flown before, because of the way Don found lift. Well, the punch line is that Don had a Thermal Sniffer in his pocket and was using it - very effectively! How about that? You never know what the Silver Eagle is liable to pull. He can be a sneaky rascal. ■



by Curt Nehring
San Dimas, California

Author's daughter, Lisa Whiteside, & Visionary. Whiteside photo.



The Visionary Cheap 'N Easy

...by Don Whiteside
Lafayette, California

The VISIONARY, by Hanger 4 Models, is a mid-sized, inexpensive (less than \$50), "foam and tape" sailplane. It is intended to be a trainer and/or slope fun airplane. It is the big brother of the popular WHIRLWIND. Its primary appeal was simple construction needing a minimum of special tools, little building time, and the promise of a fun, easy to fly, light lift sailplane. One of my goals in building and flying the Visionary was to explore the "low-tech" (cheap) side of RC soaring. While I believe this hobby has a great Giggle per Dollar ratio, I also think that some of the most fun has been with low time-and-money investment planes. There is as much "thrill of victory" and less "agony of defeat". Bigger risks are worth taking...

Who is this guy, you say? I am a novice

"sport" flier and builder who flies mostly on the slope. I reentered this hobby about a year ago after a 15-year hiatus (marriage, kids, work). Fifteen years ago, I barely managed a few solo flights using a small gas trainer. I've flown and/or built a few models in this last year, varying from a Gentle Lady, to a Corndogger IILC (my current favorite), to a bashed (3-axis, glass wing, HEAVY) Chectah. Included in my menagerie of planes have been several "foam and tape" jobs. I've relished almost every minute of my RC experience. I have particularly enjoyed the mentoring, companionship, advice, help, constructive criticism (ridicule), and old gliders I have received from my friends in this hobby. Also, I am an absolute neophyte at writing. This is the first attempt at something like this since a C+ term paper in college.

Construction and Covering

This is truly a beginner's construction project. The instructions are clear and straight forward. The kit is amazingly

complete, with ALL hardware and supplies. I only needed to add glue and, because of some modifications I'll describe later, a few pieces of scrap wood and fiberglass. This kit can be built and COVERED with only the addition of some glue!

Another big plus for this kit is being able to build it with only a few tools. It can be built with an Exacto knife, some sandpaper, and optionally, a razor saw. I used a soldering gun to make servo and other wells in the fuse, but this could be done with the Exacto knife. This is a big advantage for a beginner.

The project consists of:

- 1) Gluing some fir spars and long-erons into pre-routed slots in the foam wing and fuse, and optionally, carefully sanding the fuse into a rounded shape.
- 2) Cutting and gluing some well marked balsa sheets to make the tail.
- 3) Covering the entire plane with the provided packing tape.
- 4) Attaching the subassemblies.
- 5) Installing the radio/servo gear.

Even opening the box was a treat with everything carefully wrapped in multi-color paper (No wadded up old newspaper here!), and well organized. The only minor complaint was that the aileron stock was quite rough from the band saw and required some sanding. Counterbalancing this is the fact that the ailerons are precisely cut to airfoil size and INCLUDE the hinge taper.

I had previously built a WHIRLWIND and the construction is identical but on a larger scale. I reluctantly confess that I actually never read the instructions for the VISIONARY until after it was built. I actually timed EVERY moment I spent working on the VISIONARY. (Ever done that? It's a bit scary to actually add up the time on a complicated project.) Even

with the modifications I'll discuss in a moment, the total time, box-opening to test launch, was just under 10 leisurely hours, over five sessions. I'm sure it could be done quicker.

I installed standard servos, a standard receiver, a switch and a 250ma battery. Micro gear would lighten things, but isn't necessary. I needed about 2 ounces of nose weight to get it near the forward CG point. Perhaps a better option would have been one of the short, flat, slightly fatter 500 ma battery packs that would have given me more endurance and provided the weight.

Modifications

I made several modifications to this kit to try to better fit my needs.

Need #1 - Fit into my car with its 61" trunk. The utility and availability of any sailplane are greatly reduced for me if I must carry the wing in the passenger compartment. So, though it is heresy in some circles, I hopped off about 1 1/2" on each wing tip to reduce the total span to 60".

Need #2 - Increase the "crashability" and field repairability. The second set of modifications was also partly to meet the car trunk limit. The VISIONARY, like the WHIRLWIND and most other foam and tape planes, is designed to have the wing attached permanently to the fuse with silicone. On a smaller plane this is not a problem, but with a 60" wing attached to a 40" fuse, you might need a van or truck to fit the whole thing in. Also, when you're out flying low inverted or rolling passes (notice I said "you're" and not "I'm"), and the ground jumps up and bites a wing tip, you are probably done for the day. These planes are light enough to survive many of these impacts, but when the silicone gives, there is no quick field repair (using silicone). I've taped them together and managed a few more flights but it gets tough. So... Heeding the advice of Fred Mallett, who wrote a great column in the September

1994 RCSD entitled "Survivability", I decided to build a little shock absorber into the VISIONARY. I wanted to be able to rubber band the wing to the fuse so I could separate them for transport AND they could separate without damage when they... well, you know.

To accomplish this, I wrapped a 16 inch section of the fuse, centered on the wing saddle, with one layer of 3 ounce fiberglass and a light coat of 12 minute epoxy. By carefully heating the epoxy with my heat gun, I got it to flow quite evenly, smoothly and thinly. I also glassed the middle 3 inches of the wing, top and bottom. I then added two small dowels just fore and aft of the wing saddle for rubber band attachment. I reinforced the fuse around the holes for the dowels by gluing on 3/4" square pieces of 1/16" plywood. I estimate all the glass, wood and epoxy added about 2 oz. I also cut and sanded the overlapping top piece of the wing saddle so the wing can slide forward without breaking the fuse.

The other part of these crashability modifications was to not use silicone to permanently mount the tail. Instead, I glued a 1/16th piece of plywood on the tail saddle and attached the tail assembly with mounting tape. If it strikes something and separates, it is a 45 second repair to get it flyable again. This mod also added a little weight at the extreme aft moment. The extra pieces and the resultant lead in the nose also added about 2 oz.

So, to sum the modifications up, I have a slightly shorter removable wing and a different tail attachment method. No big deal.

My VISIONARY ended up weighing a hefty 23 oz., for a wing loading of about 6.5 oz./sq. ft. Hanger Four tells me that with standard gear, the VISIONARY should weigh about 16-18 oz.

Flying

The VISIONARY flew wonderfully and

with no surprises. I was actually hoping for a light wind day to test its ability to stay aloft in minimum lift, but it was blowing 7-15 mph the afternoon I flew it for the first time. With the light wing loading, I suspect it will stay in the air in light lift. My personal preference, however, is for more wind, more speed, more thrill. It penetrated well, even when the wind gusted to 20 mph. It tracks smoothly and turns crisply with little adverse yaw. (I set up aileron differential mechanically, with about 3/4" up and 1/4" down. I used 7/8" elevator throw each way, which is more than enough.) For a beginner, I would recommend setting control surface throws to minimums. My VISIONARY rolled well, but not fast. Inverted flight was stable and with a little more speed than when upright, not much forward elevator was necessary. I flew about a third of the initial flight upside down! (Yes, deliberately!!) Inside and outside loops were easy, with easy stall recovery at the end of a blown outside loop. This plane has no dihedral and will not "automatically" roll level when in a bank. However, when my hands got cold, I got it as level and high as I could, put the transmitter down, found my gloves in my backpack, and put them on with the plane still in generally the same attitude I started it in. This plane is easy and fun to fly!

I couldn't bring myself to deliberately test the effectiveness of my "crash saver" mods, but I believe they will increase the life of the plane. It did assemble quickly after the ride to the flying site in the trunk of my car! I used four #64 rubber bands to hold the wing on. It seemed to stay firmly in place during all my thrashing around. The plane passed my "whistle test", meaning on a high speed low pass it didn't whistle or make any other loud noises that would suggest turbulent airflow.

Conclusions

The VISIONARY fits the bill of Cheap 'n

Easy. I learned about ailerons on my Katie II, but I would recommend this plane over the Katie. It provides a little better feedback and will fly in lighter lift. It can be flown slowly, or quite fast. I am really looking forward to loading it up with ballast and seeing how strong that wing tape really is! While I didn't get a chance to do it before writing this article, I intend to tape on a tow hook and launch with a high start. An experimentally inclined modeler could try all sorts of tricks with a VISIONARY. Flaperons? Full axis control for real aerobatics? Extra servos would be easy to add. I think with a vacuum bag setup, you could

build an all fiberglass plane quite handily. The first person I showed it to at my local hill (Del Valle Reservoir in Livermore) instantly said, "We could all get one and race them." I agreed and suggested we race them and then fly combat with them. It would make a great club "one design" race or combat plane. It's cheap, it's easy, and it's FUN!!!

If you have questions or comments, I'd enjoy hearing from you. E-mail me at dwhiteside@aol.com. The VISIONARY is available from local hobby shops and some mail order houses. For more information contact Hanger Four, 415/ 257-7853. ■

Intimidation

...by Pancho Morris
Mesquite, Texas

Lately, there has been a good deal of talk about how we can get new members and new fliers to join us, and how come there has been a decrease in attendance at our monthly contests. A word I have been hearing frequently is "intimidation".

A person coming to the field on a weekend or during a contest, sees a field full of high tech foam and fiberglass ships driven by high dollar computer radios, and he must think, "Wow! This is serious stuff!" There are several reasons for this. Our group and the state of the art in sailplane design is moving in this direction. We don't have as many novice and sportsman class fliers flying built up bent wing planes. One of the biggest reasons is that there are almost no built-up, bent wing intermediate class ships being kitted right now. Since Airtronics discontinued their Sagitta and Cumic series kits and Craft Air, and their Viking and Golden Eagles are gone, there are no

major manufacturers producing kits like these on the market. Even some of the smaller manufactured kits like the Southwind and Prodigies are gone. Pierce Arrow's Gemini MTS is about the only kit out there, and it is not readily accessible.

Intimidation at contests can be a result of the strange transformation that comes over some people when there is competition present and "hardware" to be won. Generally, mild mannered, friendly people take on a new personality. A visitor or a new contest flier might show up at a contest and run into these people and think, "Man. This is way too serious for me! I'm here to have fun." They may not have seen these same people on a friendly Sunday afternoon. Some of our other fliers may have stopped flying contests because they don't find them fun anymore.

I don't know what the answer to the problem is. There is no easy answer, if there is one at all. We must keep this in mind when we are out flying and greeting new people. ■



McCombs' Kevlar Hinge

A few months ago we presented a spar system developed by Kelly McCombs of Fruit Heights, Utah. In this month's column we'll describe a Kevlar fabric hinge system which Kelly uses in composite structures.

Many builders use Kevlar as a hinge material, but most have found hinge failure after several hundred cycles. This is because the epoxy penetrates the fabric during the vacuum bagging process, producing a brittle matrix which rapidly fatigues. What is needed is commonly called a resist — a material which will prevent the epoxy from penetrating the Kevlar, leaving the fabric in its original state, free to flex. Surprisingly, the resist which Kelly uses is a common grease pencil, as used for marking china and glass! A detailed description of the entire process is outlined below:

- Mark the hinge line with a pen or pencil. Be sure to mark the top, bottom, and both ends.
- Apply one layer of Kevlar fabric to the hinge line using 3M "77" spray.
- Using the grease pencil, mark a 1/4 inch wide area directly over the hinge line. Choose the color of the grease pencil carefully, as you will want to have good contrast between the grease pencil marking, the yellow Kevlar fabric, and the carbon fiber which will be added in the next step. Kelly suggests red or blue rather than yellow, black or green.
- Apply a single 12K tow of carbon fiber over the hinge line using 3M "77" spray.

A portion of this material will be removed in a later step, but what remains will reinforce the hinge line.

- Apply fiberglass cloth to the entire structure, including the control surface. Use 3M "77" spray, or follow your normal construction practice.

- Vacuum bag as usual.

- Once removed from the vacuum bag, cut a V groove into the structure on the side opposite the hinge. This groove provides the clearance necessary for proper hinge movement, so it should go all the way through to the Kevlar hinge material.

- Flex the control surface so the V closes completely. Using a razor blade held vertical to the hinge line, scrape away the fiberglass and carbon fiber until the grease pencil line is just visible.

- The control surface hinge is now complete.

This process, with appropriate modifications, can also be used by builders who prefer to construct the leading edge of the control surface and the trailing edge of the main surface prior to 'glassing'.

An added tip... If a length of music wire is imbedded in the leading edge of the control surface, the CG of the control surface will be shifted forward, inhibiting flutter.

Kelly included a small sample of a completed Kevlar hinge produced using the above described techniques. The resulting hinge is extremely strong and very flexible. As is usual with any new construction method, this technique should be tried out on scrap materials at least once before being applied to a model structure.

Comments, questions, and suggestions are always welcome. B²Kuhlman, P.O. Box 975, Olalla WA 98359-0975 USA.

■



Jer's Workbench

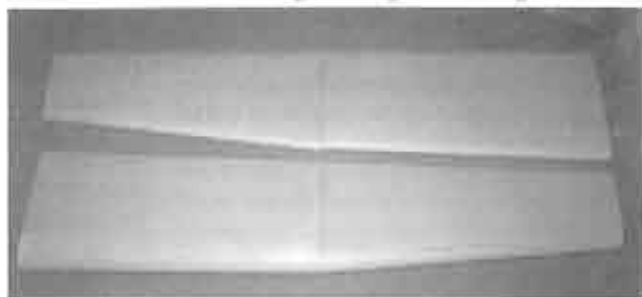
Jerry Slates
P.O. Box 2108
Wylie, TX 75098-2108
(214) 442-3910

Preparation

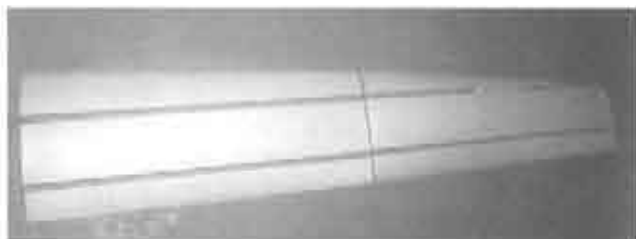
The preparation of a set of foam core wings is probably the most aggravating part of making a set of foam core wings. Right? Right! Skinning the foam cores is easy, but more about that later.

Several years ago, I was asked by a club member if I would help him make his first set of foam core wings. These were to be replacement wings for a set of built up wings that had been damaged in a wreck, and he didn't want to try and repair them. Well, he came over after lunch on Saturday and he was thinking that we could just whip these out and be back into the air the next week end. He did bring a set of plans, and wanted to use a different airfoil. No problem. Then, I asked him a few questions. "What kind of spar system do you want to use? Do you want fiberglass between the foam core

and balsa skin? Do you want to use carbon fiber? Are you going to put servos into the wing? And I think that you should use a different wing rod, something a little bigger than the one that you have there." By the time we were through talking and sorting



#1 Foam cores



#2 Foam cores cut into strips



#3 Hard point glued onto spar



#4 Completed foam cores



#5 Fitted tip panel plugged into center section



#6 Template - for identical root ribs

things out, the only thing that we got done that week end was making a set of templates for cutting the foam cores. He did all of the work. Because of his limited building time and needing my help, the wings were completed in about two weeks.

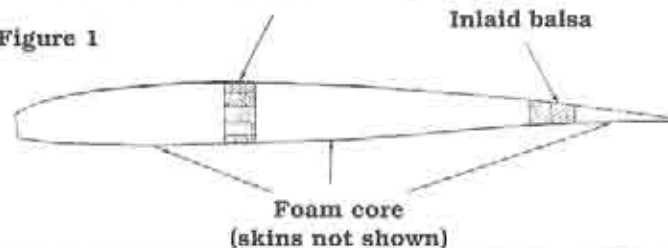
As you can see, preparation is very important; the more preparation that you do, the easier and less time it will take to do the next project.

Before we get started on my next project, building a foam core wing, I want to say that there are many ways to build a set of foam core wings. My approach isn't the only way; there are no rules. You can ask 6 or 8 different people how to build a set of foam core wings and probably get 4 or 5 different ways on how to do it.

The wing that I am building is going to be a 112 inch, RG-15

Laminated balsa & carbon spar

Figure 1



profile, 3-piece, bolt-on wing. It will feature the following: triple taper leading edge, full depth laminated balsa/carbon spar, hard point for the bolt, and an inlaid balsa strip, so that I won't have to face the ailerons, flaps and trailing edge of the wing after the ailerons and flaps are cut off of the wing. (See figure 1.) For more information about the laminated balsa/carbon spar, see the January 1995 issue of *RCSD*.

The inlaid balsa strip is something that I have wanted to do for years, but I thought that it would be too difficult or hard to do, so I never did it. Then I got a Spectrum from Slegers International. This is a plus feature in the Spectrum kit.

Well, it's time to start to work; I think that all of my preparation is done. I have my laminated balsa/carbon spar, hard point for bolt, pre-cut balsa strip and a set of foam cores.



Gordon Jones, 214 Sunflower Drive, Garland, Texas 75041; (214) 271-5334

Design Thoughts Part 2

The next item on the agenda is the tail feathers. The definition of stabilizer is: "an airfoil used to stabilize an aircraft in flight." That is exactly the purpose of the stabilizer, whether it be a full flying stabilizer, a T-tail at the top of the fin, or one that is attached to the fuselage. It also provides the pitch control to the aircraft through a conventional elevator or setup as a fully flying surface.

Another option is a V-tail configuration that uses a stabilizer set in a "V" configuration that provides the stabilizing affect. The V-tail configuration can be setup with either elevators or be a fully flying surface.

Starting with a set of foam cores as seen in picture #1, cut into strips as seen in picture #2. Using a hand saw with a fence to make all of my cuts, I started at the trailing edge and working forward. Be careful, and lay out the bits of cut foam so that they don't get mixed up. Next step is to glue all the bits together. Starting with the foam core trailing edge, glue this to the balsa strip, center part of foam core glued to the balsa strip, laminated balsa/carbon spar to center part of foam core, hard point to laminated balsa/carbon spar (See picture #3.), and then the leading edge foam core to the laminated balsa/carbon spar and hard point. Glue on root ribs (picture #4). See how fast that went together? That's preparation. Picture #5 shows tip panel plugged into center section of wing.

Next month, I will skin the foam cores and show how to find the bolt hole in the hard point. ■

Several considerations come into play when designing the tail feathers for a new airplane. First, there is the type of flying that will be done with the design. If you are building an airplane that you want to fly fast (F3B or slope), then a thinner section should be used. If you are planning on a thermal airplane then a slightly thicker design is needed.

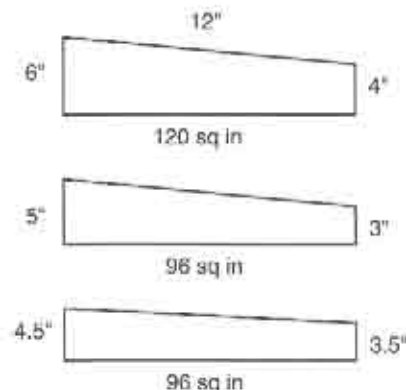
Another consideration is tail moment: how far is the front of the stabilizer from the trailing edge of the wing? If the distance is relatively short then a larger stabilizer is required. If the tail moment is fairly long then a smaller stabilizer can be used.

Here come the numbers. The average area of a thermal stabilizer is 10 to 12% of the wing area. Some applications such as slope or F3B will use less (say around 9%) and with a V-tail configuration you will want more as you don't have a fin/rudder to add into the equation (around 15%). Some designers modify these num-

bers depending if the stabilizer is thick or thin. As with wing design it is a trade off. Using the wing with 905 square inches you will find that 10% = 90.5 square inches, 11% = 99.55 square inches, and 12% = 108.6. With these figures in mind it is time to layout the stab. Again, the designs are endless; long and narrow, short and fat, and all the other combinations in between. Usually somewhere between 10-11% works out very well or at least that is what I have found works best for me.

Next is laying out the planform of the stabilizer. Keeping in mind the percentage of area that you want for the stabilizing function, lay out a planform for the stabilizer. Again, you can look at some of the stabs that are used on the planes at the field and get an idea of what will work.

The illustration below shows some of the layouts that are currently used. A variation of any of these, while keeping the area in mind, is a good starting point. Looking at the drawings we see that the changes in the root and tip sizes increase the area fairly rapidly. The length of the stab can be used to change the area, so don't forget to use it as well.



The other factor that comes into play is

the size of the fin and whether you want the stab to overlap the rudder. Plus determine what kind of construction will be used to make the stabilizer. In some instances you have either a narrow or a wide fin that determines the root dimension of the stabilizer. That makes the process easier or harder depending on your point of view. I like to keep the stabilizer as close to the size of the fin as possible. If some of the stabilizer is going to protrude back behind the rudder line, I want it to be as little as possible. Of course, this is my personal preference.

Here is where the LAR (Looks About Right) theory comes into play again. If you have everything the way you want it, it should look about right, as well. Again, check some of the designs at the flying field and see if you are on track just to make sure. ■

ANNOUNCEMENT

DR. SIGHARD F. HOERNER'S "FLUID DYNAMIC LIFT" AND "FLUID DYNAMIC DRAG" ARE AVAILABLE FOR A LIMITED TIME ONLY FROM B²STREAMLINES.

These two books are classics. Both contain an incredible amount of information about their respective topics, and are often cited in technical papers. Each of these books can cost \$120.00 or more through a technical book store. Our retail price for hardbound copies of "Fluid Dynamic Lift" is US\$93.00; US\$94.00 for hardbound copies of "Fluid Dynamic Drag". All packaging and postage costs are included in these prices. Orders must be received by April 30, 1995. Checks and money orders in US\$ only; sorry, no credit cards. Washington residents must add 7.6% sales tax. B²Streamlines, P.O. Box 976, Olalla WA 98359-0976. ■

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Youth's Response

A few months ago I wrote an article on what I thought was an absence of younger people getting into the sport of Soaring. Few articles of mine have brought as much response as that article. Some of the responses from experienced pilots or parents were kind of sad. For example, "I don't have the time to teach someone, because I am busy practicing for contests." Or, "I can only afford one airplane in the family - mine." Some of the reasons that made sense were: not enough money for one plane let alone two, no time due to job commitments, lack of skill to teach someone else or, as one reader said, "Young people do not seem to be as interested in model planes today as they were years ago."

Things are not as gloomy as they seem, though. On the plus side, I got a lot of letters and calls from people who are getting young people into the sport. Not enough, but some. In some cases, if the desire is great enough, it can be done, as Dan Bernauer did. His letter follows.

Dear Ed,

"My name is Dan Bernauer, I am 17 years old and I am Secretary of Seattle Area Soaring Society for 1995. I have been flying radio control sailplanes for just over a year. And I raced radio control cars from 1984 to 1992.

"Yesterday, I received my January issue of RCSD. The title "Young People in Soaring" quickly caught my eye. In my area, there is only a handful of young

people interested in soaring. I can only think of one other young active member in the SASS club, Jonathan Reed. The club is made up mostly of people over 30. I think the biggest reason for this is the cost. But, also, I think that the plane kits can be intimidating for someone totally new to radio controlled models. Also the hobby shops don't carry hardly any sailplane stuff: when confronted with this, they just say it is too specialized and they can't make any money with it. In general, there are lots of people interested in soaring in the North West. By the end of 1994, the Seattle Area Soaring Society had over 120 members. And at the World Soaring Jamboree, I am sure you got an idea for the great conditions and sights that we have here. In 1995, the SASS club is trying to keep the general public better informed about our club by keeping all the hobby shops well stocked with contest flyers. Hopefully, any parents who buy a sailplane at the store will bring their son or daughter out to watch the contest. Not one beginner is turned down if they ask for help, which is different from what I see at the gas fields.

"It is unfortunate that there are so few young people in this hobby. I am lucky to belong to the Seattle Area Soaring Society. I would not have been able to successfully fly and build my planes without instruction and advice from people like Jim Thomas, Sherman Knight, George Zatlaka, Joseph Conrad, Steve Cameron, Phil Pearson, Doug Buchanan, Don Bailey, Jim Muri, and Charlie Harris. I think that it is very important to a club to have people like these, who are willing to help out at any time. I have heard from many people who have lived across the U.S. that this club is one of the best. I wish that any frustrated beginner could belong to a club like this."

Sincerely, (signed) Dan Bernauer

Stop the Press!

Just as I finished the above article, I was

informed by Judy and Jerry Slates of a group of materials available that would greatly help clubs, individuals, and schools get people started in R/C soaring. My package arrived UPS red label, and the information looks great! There is hope yet!

The first is a catalog of teaching aids by a company called PITSCO. The catalog, one of many they have, is the Aerospace edition. The catalog is about 125 pages, in full glossy color. They have planes, rockets, books, tools, computer software, and hundreds of related materials that have to do with flight. You do not have to be a teacher to order this catalog. I would highly recommend getting this catalog if you or your club has any interest in promoting the sport of flying.

One of the books mentioned in the catalog is by Steven A. Bachmeyer and is called "Radio Control Soaring". This book is hot off the press, and is only one book of a series of educational books on the subject of aerospace technology. This book would be a great guide for anyone to use for teaching the sport of R/C soaring. It would also be very helpful for seminars or for an adult education class.

"Radio Control Soaring" is 50 pages of information from "What is a Thermal?" to "Making Composite Wings". It covers such things as flight, principles of radio, how radio control works, building model sailplanes, soaring techniques, experimenting with airfoils, plotting airfoils, vacuum bagging, designing, and much, much more. For entry level instruction, this is one of the best books that I know of.

What this means is that there are some very good materials available to those who would like to get involved with training. With my international business, I get many magazines, books, and newsletters from all over the world, and I have noticed that in almost all of them some mention is made of, or pictures are

shown, of clubs or individuals helping people to get started in RC soaring. There is much more activity than in the United States, and I am not sure why this is. But with the new material available today, this may change.

R/C Soaring Digest has obtained 30 copies of the material and, at the time of this writing, most of the copies are on the way to selected clubs such as the Seattle Area Soaring Society, or individuals involved in teaching others one or more aspects of soaring. We are most interested in what they think about the material, and are proposing a pilot training program, thereby hoping to encourage more clubs or organizations to give it a try. We hope to share their reactions through the pages of RCSD.

What do you think? I am very interested in any input you may have. If you wish to contact PITSCO for a copy of their catalog, their address is PITSCO, P.O. Box 1708, Pittsburg, KS 66762; (800) 835-0686. I almost forgot. The cost of "Radio Control Soaring" is \$5.95. ■



ZIKA



Flying at Lake Poway OR Hand-Launch Topics

...by Scott Smith

2 Sugarpine, Irvine, CA 92714
(714) 651-8488
evenings after 7:00 PST

Rainy Season

Those of you who don't live in Southern California have probably read about our rain. The first handlaunch contest by the Torrey Pines Gulls in Poway was held nearly in a lake. "When it rains, it pours..."

Annual Riverside Contest Classic

The date for the Twelfth Annual Inland Soaring Society Hand Launch Contest in Riverside, CA is June 4, the first Sunday in June. Better publicity should bring this classic's attendance back up from last year. In any case, it is always a great contest. Be there.

A Skill-Testing Round

Here's an interesting first round format for a hand-launch contest being used by the Torrey Pines Gulls when the air is still "too dead" to thermal. Here's how it works: Throw your glider and try to catch it for a **minimum** flight time just **over ten seconds**. Now throw it again and try to catch it for a flight time at least **one second longer** than the **previous** time. Continue doing this, adding at least one second to each flight time, in a ten-minute round. Flights that are not at least one second longer than the previous accepted flight **do not count**. The score for the round is the number of flights meeting the above criteria.

It's a lot harder than it sounds. If your first flight is 14 seconds, and your next flight is 20 seconds, at the end of ten minutes you will have had to make some impressively long flights, especially in

dead air. Hint: aileron ships nail this round.

Model Shows

There were two model shows within a week of each other, one in Long Beach and one in Pasadena. Amazingly, there were more hand-launch gliders being displayed than all the other sailplane models combined. Pete Young was kind enough to share his notes as follows:

"Dragonfly" by Randy Wilson, 6490 Kell Lane, Las Vegas, NM 89115, (702) 438-8510. SD7037 airfoil, 1/32" balsa over foam pre-sheeted wing and V-stab, CF fuse. 13 oz. Available direct only @\$125.

"Viper" by DCU, a popular manufacturer of slope planes. Pre-sheated wings and stab, carbon push rods, wing/stab joiners to easy disassembly, SD7037, 450 squares, \$211. Much of the price is in the extensive high-tech materials used.

"Quest" by K&A, SD7037 sheeted foam, built-up fuse (\$80) or fiberglass (\$130), 370 squares, 12 oz.

"Avenger" by Mark Allen, pre-sheated balsa or obechi wings, prices from \$150 to \$200 depending on options. Unusual twin boom to inverted V-tail, the P-38 of hand-launch sailplanes. I've thought about a similar configuration and so I have high expectations for this model. Contact Phil Lontz, 1501 San Anselmo Ave., San Anselmo, CA 94960, (415) 457-1550.

"Illusion" by MM Glidertech, SD7084 (thinned E-205 variant), all built up construction, 12-15 oz, list price \$41.

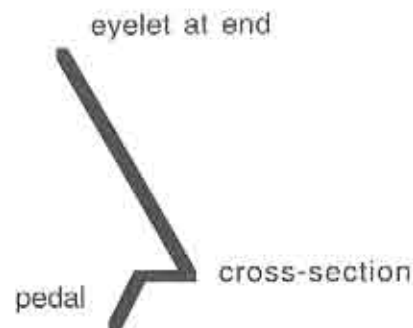
"Whipit" by Global, SD7037 obechi over foam, composite plastic fuse, available in limited quantities for \$130 as almost ARF. Imported.

Face it, hand launch is the happening thing in RC soaring.

Atlant's (cont)

I built one. I finally built one. The one with the foot pedal and the long stick the end of which you hook the plane. Looks

sort of like this.



Made of a redwood 2X2 where the long piece is 8 feet long and the other two are 2 feet each, I braced the corners with flat L-braces purchased at Home Depot. Planed the long stick to a nice rounded cross-section. Used MRL glider polish to "protect" it. (Well, a little goes a long ways and MRL sells a big bottle. Wha' da' ya' want?) Beautiful.

Time to try it out. Here goes. Stomp on the pedal (i.e., the short end). The metal braces "deform". No action on the long stick. Guess there's a lot of torque through the center piece.

So, I buy more hardware. Now, in addition to 4 new flat L-braces, I add 2 inside steel corner braces. Time to try it out. Here goes. Stomp on the pedal. Center wood section snaps.

Hmm. Epoxied the center wood pieces back together. Purchased roll of fiberglass shipping tape. Applied thin layer of 30-minute epoxy on center wood section, then tightly wrapped most of the fiberglass shipping tape. This sucker may split, but it won't go anywhere. Taped the long section and the "foot pedal" also.

Time to try it out. Here goes. Stomp on the pedal. Long end swings through the air. Success! Time for flight test.

Go to contest in sloshy field. (See rain report above.) With help from others,

hook plane to eyelet at long end of atlant.

Time to try it out. Here goes. Stomp on the pedal. Plane magically appears in air moving smartly away from me. Awesome. Plane makes all of ten feet vertical in air, about enough to turn around and fly back to me. The pilots around me are not impressed. My atlant is too flexible to transmit the necessary energy to the plane. Plus, the long stick, at 8 feet, is probably too short.

If anyone out there has any ideas, please let me know.

Next month I'll report any further progress. Unfortunately, redwood doesn't burn very well. ■



TRAINER CORD

Kitty Pearson
1075 Space Park Way #182
Mountain View, CA 94043
(415) 962-8048 (eve.)

Enlightenment

Finally, there was a weekend break in the sunny California deluge. We spent it on Glider Hill in Coyote Regional Park. My favorite instructor put off doing all those household chores to spend time coaching me to fly Sunspot. Although, as coach he feels he should watch my stick movements, I on the other hand consider that one of his primary duties is to be my wind break.

The first part of the morning was spent doing the rote exercises by command. Do a figure eight pattern. Again. Again. Start your turn, then flatten your wings out with a little opposite rudder. Don't hold the stick, because the plane will want to spiral. Then, I progressed to practicing with the elevator and learning the full significance of the word "gently". When the stick is pushed gently forward, the elevator moves down. This causes the air to push the tail of the plane skyward and the nose dirtward. I visualized what the controls were doing and what their reaction to the air is. This makes the corrections understandable. A left rudder moves the rudder to the left which causes the air to deflect off it. This action results in the plane moving sideways through the air. When the plane yaws, the inner wing drops and the upper wing rises, because the inner wing is no longer moving forward through the air as fast. It does not generate as much lift at that moment. To flatten the wings, the correction is a little opposite rudder.



The beauty of these innumerable repetitions is that they were repetitions and not restarts. I had repeated the same maneuver enough that the movements were becoming reflex. Now, I could actually begin to feel the air. I could tell what was happening when I radioed Sunspot to commence a circle, and it went shooting past my invisible turn mark. It had been sailing smoothly in the lift band and had gotten to the notch in the hill where, suddenly, it moved fast and responded slowly. Sunspot was in the air rapids. The air was compressing to get through that notch and carried Sunspot with it. I should have started my turn sooner. Now, the commands would have been more forceful.

My instructor was almost asleep on his feet, and my hands were frozen to the transmitter with only my thumb still retaining movement when the watch alarm sounded the alert. He is meticulous about setting it so that we will never out fly the receiver batteries.

Now, you can see how important it is (unless you have stock in the epoxy company) to "know your hill". Flying is like invisible white water rafting. Water and air are both fluid and react with the same principles. So, the trick is to either bring an expert, or consult with one of the regulars.

This hobby is expanding. Not only do you need to know how to fly a plane, but you need to know your terrain and be able to read the air. Of course, you need to watch the weather to know whether or not you want to fly.

Landing requires that you file a mental flight plan. The pattern is downwind, base, final. Downwind, the plane will be

moving faster. Your base is crosswind. Final should bring your plane sliding across the grass beside you. The purpose of a pattern is to gain consistency. With practice, you will be able to see in your mind's eye a landing gate through which to initiate your pattern. The use of the pattern allows you to compensate for changing conditions. If you are too high, you can adjust the pattern. If the wind has shifted, the legs of the pattern can be lengthened or shortened. If you are too low, always move (run), so that you can watch to see what obstacles are looming. If you can't see it, you can't fly it.

Planes are contrary creatures. Sunspot slipped behind the hill. I just knew it landed perfectly. Alas, when I arrived for retrieval, Sunspot flew past me. (It was grinning!)

Sunspot and I have developed a rapport.

Video Review

Old Buzzard Soaring Video

...by David L. Steere
Oakland, California

Of possible interest to RCSD readers is a newly released videotape by Dave Thornburg, "Old Buzzard Goes Flying". The video, while having somewhat modest production values, is nevertheless an excellent training video for a beginning or novice thermal flier, and exudes a good deal of Thornburg's engaging personal charm. Throughout the video, Thornburg uses the well known beginner's 2M floater, the Goldberg *Gentle Lady*, to demonstrate various aspects of thermal soaring, including high starts, thermal seeking, hand catches, and even hand launching. The \$25.00 video would be an excellent purchase for clubs, since it has a good deal of basic information of value to new fliers.

This video would have been of considerable help to me, a self-taught glider flier,

I was getting exuberant (like a teenage driver). One of the fellow pilots was fully prepared. He wore a hard hat. What a great idea, all of his compatriots having to duck. Now that I have visions of flying without a trainer cord, it is time for me to join AMA and be an insured pilot.

In California, pre-spring is the perfect time for landing practice. The chartreuse hillsides softly beckon a plane, caressing it as it lands. The flora have not yet risen to interfere. New grass forgives and soft ground gives. Sunspot slipped softly onto the new grown grass. There were five perfect landings with me at the controls. This was one Super Bowl day I'll remember. And, another model glider enthusiast actually asked me if I would like to fly his plane. ■

in my early stages of flying. At that time, all that I had by way of help were a few beginner's books, some fanciful images in my head, and a good measure of blind optimism. Just to see the way that Thornburg test glides, and then subsequently launches, thermals and lands the *Gentle Lady* would have been of priceless help. Even now, Thornburg's advice on the video about seeking out and staying in thermals is well worth looking at over and over. His "river of air" metaphor assists in visualizing the invisible, and his discussion of thermal search patterns is really helpful. Watching Thornburg hand launch his *Gentle Lady* is instructive, and gives one considerable motivation to build a light ship. And, if one fast forwards past the closing credits on the video, one will find a three minute sequence of hilarious out-takes from the original video production. I confess to taking a certain small measure of satisfaction in knowing that even someone as experienced as Thornburg can still occasionally have difficulty in hand catching a slow old floater. ■

Toward a 20-Hour Week

...by Gary Osoba
Wichita, Kansas

(The following article was received from Jim Cell of Farmington Hills, Michigan. Jim says, "I came across this article in the December 1994 "Sailplane Builder", The official publication of the Sailplane Homebuilders Association of the Soaring Society of America. This magazine/newsletter is directed at the folks who home-build full size sailplanes. The ideas Gary discusses in the article seem to have direct application to RC sailplane flying, so I asked Gary if it would be alright to submit it for publication within the RC sailplane soaring community. I know from my own experience as well as others, that we have been using the microlift technique without really knowing it. Fortunately, Gary has put in print for all our benefit.")

It's a tough job, but someone has to do it. Flying basically every afternoon, it looks like I'll wind up logging about 20 hours in the prototype, Carbon Dragon, this week. The work conditions have been deplorable... More than one can bear! Pristine air... Crisp, cool, clear. Dodging 2-3 foot corn leaves sucked into the atmosphere by big, smooth thermals. Dust devils and migrating gulls below mark the thermals many miles into the distance with nearly unlimited visibility over the flatlands. A mile or more down, the earth is carpeted with a deciduous delight. Light winds aloft make it possible to move around quickly at will in any direction. Although not engaging cross-country tasks aggressively, 400-500 miles will be covered before the week's end. My lift band at 4000-6000' AGL has been consistent and efficient. Typically, in blue conditions, I've been able to travel in any direction, rarely circling, by something I call microflight techniques. This goes beyond simple dolphin strategy, and fully captures the vertical energy in our atmosphere, which is free for the taking. Macro-lift (thermals, orographic,

wave, etc.) is the easy stuff. Microlift is comprised of disorganized bubbles, disintegrating thermal fragments, and thin, string-like animals that meander through the sky and often flow into thermals like a winding stream would a lake. Microlift is fleeting, elusive, and rapidly changing. Fully exploiting it is one of the most challenging and rewarding tasks a soaring pilot will ever address. How may it best be utilized?

Two elements form the underpinning of microflight technique: variation in velocity and variation in heading. Last week, Chris Arai nicely addressed the basics of dolphining through a variation of speed. I was happy to see that he made a distinction between conventional speed-to-fly theory (essentially speeding through interthermal space as if it were always a homogenous unit of sink) and flying a narrower, somewhat slower speed range (which through variation of velocity takes advantage of the minor vertical discontinuities which exist). The latter technique is obviously better suited to negotiate microlift. The truth of the matter is that although sailplanes do possess glide ratios and speed capabilities much superior to hang gliders (or ultra light sailplanes), they simply can't fly slow enough to fully utilize microlift. It may all come together for them in strong streeting conditions, but even then pure dolphining occurs far less frequently than you might think. Actually, hang gliders are much better suited to take advantage of microlift through dolphining because of their slow speed capabilities. This does not necessarily mean that their glide ratios have reached a point which provide for frequent level flight while doing so. It simply means that they are capable of extracting the lift while a sailplane may be roaring through what feels like very light turbulence and miss the benefit of the lift it contains. On the other hand, when utilizing microlift I have found that the 100 fpm sink and 27-

I glide of the Carbon Dragon is sufficient to frequently provide for extended level flight because of the hang glider-like flight speeds. However, variation in heading plays a critical role in producing these results. In fact, more often than not it plays a more significant role than varying flight speed. Microlift strings (another term I have coined, if you'll bear with me) are often only a wing span or so wide. They may stretch for miles, but can meander widely and suddenly. The challenge is to stay centered squarely above them through sensitive, instantaneous changes in heading. The pilot must divorce himself from any visual references on the ground and generally in the clouds above. (I nearly always do best on blue days.) He must acutely sense the lift differential across his wing-span and constantly turn, first this way, then that, to stay centered. He'll often feel a pretty good surge, reminiscent of a thermal, under one wing and turn into it instantly by reflex... If he continues the turn as in a thermal, it'll be gone! And, as he moves back around to re-enter the string he won't find it. There's often little vertical depth to a string and he may now be below it. When feeling such a surge, it's best to make a rapid, firm turn into it followed by an instantaneous correction back the other way with maybe half the firmness. Then be alert to sense the lift differential across your span and make another instantaneous correction... then another... constantly reacting... always sensing. As the old adage says, "Lift is where you find it". Follow it wherever it may go. When you think you can't work it any further, try harder. The results are often limited by your level of finesse, not ambient conditions. We're talking about a delicate high-wire routine which, if performed properly, will leave you applauding your flight! As you might expect, intuition (or probably more precisely heuristic reasoning) plays a significant role in locating and continuing

with microlift phenomena.

Some degree of microlift exists in every soaring environment. Some days, it's minimal. Other days, it's extensive. Its strength and consequent usage in relation to macrolift is something a pilot will have to judge for himself given the flight parameters and goals at any given time. Fully utilizing it does not of necessity impinge on cross-country tasks and at times can enhance them. Simple trigonometry will show that even when working macrolift systems, relatively large divergences from heading toward a distant goal can be justified in the pursuit of lift. Only when the angle of divergence grows to something on the order of 25 to 30 degrees does the divergence start to significantly subtract from total distance flown. The rapid, fleeting variations in heading which take place during microflight techniques have a minimal effect on distance flown when microlift is good and your overall course is not dramatically divergent. I often make same flight/same condition comparisons of macrolift and microlift techniques. It's surprising how often you can do as well or better with microlift in the Carbon Dragon, especially when penetrating against a headwind. Two days ago I was making such a comparison, flying the same 7 mile beat back and forth between a couple of towns and I followed one microstring for more than 20 uninterrupted minutes with a net gain of 200' in altitude. Although my heading momentarily varied as much as 70-80 degrees to either side of my course at times, I never turned a circle. I remember one day earlier this summer when we had 20-25 mph winds aloft which had to be penetrated in order to stay in the vicinity of the gliderport. (I wanted to land where I took off.) In spite of relatively weak conditions, microlift saved the day. Using conventional speed-to-fly, I could just stay where I wanted to, arriving back at the gliderport after each cycle with at

best a modest altitude gain. After 3 cycles, I switched to microflight technique. Now, making slow headway against the wind, I returned above the gliderport at 3000' with a net 200' loss from the time I left a thermal. I was then able to gradually progress upwind and pass up all the sailplanes (including a 19 meter open class ship many miles ahead) while gaining altitude before the conditions shut down. Most of the sailplanes were not able to stay up that day. Again, conventional soaring wisdom would not dictate that things like this can be done. However, with the right equipment, the right conditions and the right techniques, it is being done. Try microflight techniques. You'll be pleasantly surprised. ■

Gary prepared this article for posting on the Internet. He has made a number of excellent flights in the Carbon Dragon prototype, surprising both himself and a number of racing

Beginning Scale, or How I Survived First Flight Jitters

...by John Derstine
Gillett, Pennsylvania

One of the great things about our hobby is its diversity of interests. There is always something new to challenge our abilities or stimulate our enthusiasm. As participants in this activity called modeling, some of us tend to go in cycles, or circles in my case; you know... build-fly-crash-rebuild, well anyway cycles sounds better and more aptly describes what I'm talking about. We, or at least some of us, get bored or complacent with the kind of soaring we are doing, or maybe a friend or magazine article sparks an interest in something new. For me it was a relatively slow evolution to Scale soaring.

I have always admired the graceful lines of full scale sailplanes and have made frequent trips to Harris Hill, New York (20 minutes away) to watch regional & national meets. During this time from

glass owners at the achieved performance level. Thanks again for the article, Gary! Jim & Ed. ■

For information about the Soaring Society of America (SSA) & *Soaring*: their address is: *Soaring Magazine*, P.O. Box E, Hobbs, NM 88241; (505) 392-1177, FAX (505) 392-8154. They carry calendars, too.

Permission to reprint this article was also obtained from Bruce Carmichael, President of The Sailplane Homebuilders Association, 34795 Camino Capistrano, Capistrano Beach, CA 92624-1720; (714) 496-5191. The Editor, Secretary/ Treasurer is Dan Armstrong, and he can be reached at 21100 Angel Street, Tehachapi, CA 93561; (805) 822-8852, fax (805) 822-6882. If you're interested in finding out more about this association or joining, Bruce says to give either of them a call. Thanks, Bruce. Ed. ■

the 1970's through the 80's I was flying what are now referred to as Gasbags, plus a few slope soaring planes. Enter the 90's! Obeche over foam, good airfoils, and an increasing number of good European kits at moderate prices; this was as good a time as any to try this scale stuff.

I did my research to find a stable, good flying and somewhat large (by my standards) model. By the way, there are many very friendly, knowledgeable people involved in scale soaring that are more than happy to share their expertise. The only negative side to this helpful coalition is that my phone bill increased exponentially for awhile. That's what I get for living in the hills of Pennsylvania. Anyway, the plane I picked was a Multiplex DG-300-17. It is, for those not into this genre, a large, approximately 4 meter plane with plug-in wingtip extensions.

I had fun assembling the model; I even designed my own custom retract and scale aero tow release, but this was the easy part. Flying the thing was another

matter! One of my original ideas was to toss the plane off one of the slopes around the area. I had seen this done in the 1980's when a Swiss man named Steve Hangartner visited our area with a collection of beautiful all fiberglass scale ships. The largest of these had a wingspan of over 200 inches. He actually tossed this plane (with the help of an assistant) off one of the hills in less than ideal conditions, and it flew well in our East coast inland slope environment. I knew it could be done, but when faced with the prospect of throwing my brand new untested pride & joy off a cliff, I said to myself, "Naaah!"

This left several other options for first flight launching. (Hand tossing on a flat field is not recommended for testing these kinds of gliders. Their tail volume is relatively small, and they require higher airspeeds than can be generated by throwing these large airplanes. This is not to say it can't be done if you have moderate to strong breeze or long legs and a Gorilla arm. The upshot is to balance and trim everything according to the manufacturer's kit instructions and go for one of the mentioned launching methods.)

The next method I considered briefly was using a large powerful highstart. Something in the 15 lb. pull range is said to be adequate. I have used this method with many of my gliders in the past, but not with this much tension or as large a sailplane. Another twist is that you have to ROG these large flyers for the above mentioned reasons. I chickened out on this option, too. Somehow, tying my DG to a big slingshot didn't appeal to me. I had visions of a drag through the grass, wing shearing experience.

Aero towing sounded like a neat way to go, but in my area there were few people with any experience at this, including me! Winching seemed to be what was left, and in my case the best choice. However, it was not without incident. I decided to make a dolly to cradle the DG and simplify balancing the wings on takeoff. This also elevated

everything to get above any weeds. Yes, I mow my field, but I was just being cautious. The winch I was using was a hand me down with an electronic braking device of mysterious design. It had worked fine for all my other gliders, large and small.

The day came when I was finally ready to take off. The proverbial conditions were adequate if not ideal, my state of mind not being the least of these. I lined everything up being careful so that the winch line wouldn't saw one of the wings off. The dolly was set, with the DG perched on top. Line slack taken out, gear up, radio checked, etc.

Pedal to the metal, well not quite, I started the launch and was pleased that the dolly tracked straight and the glider left it behind without any problem. I pulsed the winch (unnecessarily as I found out) and maintained about a 20 degree climb. The launch was not very high but otherwise successful. The DG flew pretty much as I expected with regard to its speed, but I was totally amazed at the ability of this large, heavy plane with skinny wings to stay up. Time to land. I get nervous at this point when I'm flying a new airplane, or any airplane for that matter. All the things I planned to do are forgotten as time seems to accelerate. I ended up coming in high and fast over the end of the runway, dumping full spoilers after quickly lowering the gear. I flared a couple of feet off the ground and the DG settled in and rolled out a short distance, not by the book, but a happy landing, anyway. The second launch broke the winch, but luckily not the glider. A set screws sheared on the drum and the line tangled, transforming the sailplane into an expensive kite for awhile, but all came out well. Anybody know where I can get a good winch?

Scale soaring is fun. It does not have to be intimidating or difficult. If you are at all attracted to the looks of scale sailplanes, give it a try. Doing your homework to find out what kind of scale model suits your flying style is the key to success. ■

Fred Rettig
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Are You Ready?

Contest season is just around the corner. It guess it's time to bring out the old heavy guns from hibernation. Grease up the winch, wash and powder up the high start, for spring is just a few days away. I have looked my planes over and I guess I better put some new hinges on the flying surfaces. I might even splurge and buy me some battery end connectors for the battery. I don't know why I would really need them. Twisting the wires together always seems to have worked just fine.

Cleaned up my old converted tackle box, which is now a field box. You know, Cousin Earl said there might be some earth worms in the bottom of the box, and there was! After cleaning up and then installing my much needed field gear, it just looked like something was missing. Uh, I looked it over and everything was there. The pliers, some balsa scraps, glue, old dog tags, a picture of the wife and baby, and some fishing weights for C.G. Yep, it was all there. I guess the cleanliness of the box threw me off.

After completing my chores of getting ready my equipment for the new up coming flyin' season, I sat down with a cup of coffee and started thinking about the contest circuit. Coffee was kinda cold, so I warmed it up a little. Then I got down to the seriousness of planning and plotting my when and where and who's contest I would go to.

Now, you might say, "That ain't a problem." But, I say this takes a lot of strategy. For you see, some folk's contests you just can't go to again because the C.D. might not of said hello just right, or maybe the scorekeeper won't score your scores high enough. Maybe the tires on the truck are too slick to make the long haul. What if the contest is held in a town where some of your down line kin folks live? You know you will have to take the time and go see them. The list could go on and on as to why you can or can't go to some of the contests. After much thought, I finally arrived at which contest the wife would let me go to. Hey! I only begged on one knee! She was a push over. (What did you say, Honey?)

Completed my list of preparatory things to do for this up coming season. Now, all I have to do is wait for the days to go by 'til each new contest arrives. You know, somehow the days do come and then they go, and before you know it, a year has come and gone. Yep, we are all getting a little older and I hope wiser.

As the time gradually slips away, I have realized there is more to life than these sailplanes. Now, let me tell you, I enjoy a good thermal as well as the next guy, but I must keep things in order, such as my family, friends, work, and my relationship with God. I guess what I would like to say to ya'll is, "When planning your up coming flying season, don't forget to take care of the things that are most important to you. Take care of your family, your obligations, and then enjoy your hobby."

Signing Off, Cornfed

P.S. Say your prayers and don't forget to check for frequency control.

ATTENTION: Fred Sage of California. When tripping your wing tips, how fast do you let the wing tip hit to do more than one cartwheel? ■

Wingmaster Model Wing Designer, Version 1.1 by Websoft

...evaluated by Lee Murray
Appleton, Wisconsin

Wingmaster is a MS Windows application for creating custom wing platforms and airfoils. This is a powerful and unique program with lots of utility for scratch builders. While the program could be used for making foam wings, the greatest utility may be in designing rib type wings. A 331-airfoil database of Eppler, Selig, Selig-Donovan, Clark, RAF, Gottingen, NACA and others is provided, as well as computed NACA 4 and 5 digit and the 6-series airfoils. This airfoil database includes airfoils for model and full size power and unpowered planes, free flight airfoils, hydrofoils and non-lifting airfoils. Once you get the feel of the program you can quickly create or modify airfoils and wings. Each wing can be saved with a text description that would be useful in documenting modifications.

The program has a main screen with pull down menus for **File**, **Edit**, **Airfoil Design**, **Wing Design** and **Help**. The **File** button has options for opening, saving or printing wings, airfoils, and ribs. The **Airfoil Design** button brings up options dealing with NACA airfoils. **Wing Design** takes you to a new window where the shape of the wing is specified. **Help** brings up a list of topics and a glossary where definitions and instructions are displayed.

Wing Platform Options:

There is tremendous flexibility here to edit the shape of the wing. Wing shape variables are:

- The root and tip chords
- The sweep
- Leading and trailing edge shape. These are controlled separately except in the elliptical mode. The options are for straight, tapered,

curved or elliptical. Curved wing options include: transition (curved to linear), curve position (root to tip) and sweep.

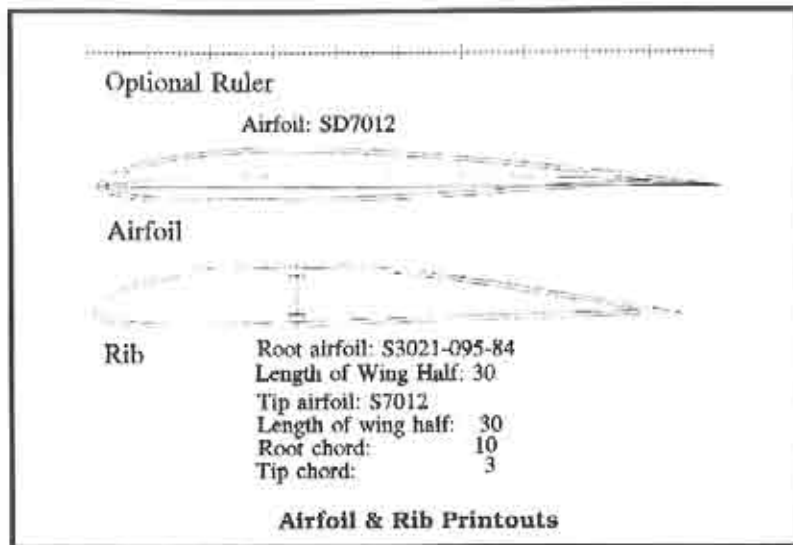


Transition, curve and sweep are manipulated with sliders on the Wing Design screen controlled with the mouse. Also these functions have data boxes where values are shown and where then can be typed in. Changes are displayed interactively on the screen. When using the ellipse option, the ellipse radius position can also be specified along with the sweep using sliders. However, the transition and curve position options are inactive. Moving the chord transition point toward the tip creates more area while minimizing wing tip drag. The wing illustration shows the wing where the curve position has been moved toward the tip.

The program deals with one panel at a time although that panel may include curved edges. If you are making triple taper foam wings, you may want to do your design in several constant taper steps. Specific printed ribs from a single curved wing design could be used for making foam cutting templates for multiple taper foam wings.

Airfoil Transition Options:

When your panel has different airfoils on the root and tip, the transition can be curved or linear and independent of the shape of the wing. A graph of the transition is displayed on a sub-screen of the Wing Design Screen. A curved transition opens up flexibility that might not



be achieved in other ways. You could accomplish all of the transition close to the root or the tip of the wing. This adds a new, valuable options when trying to solve strength or tip stall problems without destroying the performance of the wing. This would also be useful for scale modelers.

Airfoil Selection & Modification: With the NACA airfoils, you can edit the shape in seemingly endless ways. Camber (top surface separate from bottom surface), thickness, the high point of the curve both for camber and thickness. This may be a little too fundamental for many modelers, but there are many who have a good feel for how these factors can give them what they need to reduce tip stalling or improve performance. With other airfoils (Epplers, Clarks, etc.) you don't have quite the range of flexibility as with the NACA airfoils, but the camber or thickness of any airfoil can be changed. Version 1.0 of the program had no RG, SD, MH airfoils in the database and the number of Selig airfoils was limited. Now with Version 1.1 all the airfoils from Soartech 8 have been added bringing the total from 250 to 331. If you have access to the coordinates or data files for

other airfoils of interest, you can create Wingmaster airfoil files using instructions provided in the manual. To test this feature, I used the new Selig S7012 airfoil coordinates, downloaded from Compuserve. A word processor was used to add the airfoil title and a format specification. Extra line returns had to be trimmed. Wingmaster wasn't fussy about whether data is in percent of chord or 0-1 format. The data must be saved in an ASCII file format.

Plotting / Printing Output: Wingmaster can also create an HPGL (*.PLT) plotting files that can be imported into graphics or CAD packages which is what I did to create the graphics for this report or plotted by copying the file to a plotter port. The default lettering was a thin font, so I took the liberty to use larger, bold fonts for my illustrations. The wing, airfoil, and rib are all creations of Wingmaster.

The program, like other Windows applications, uses your existing printer drivers to produce the output. Printing can be done full scale or fitted to a page. Left and right wings are printed separately or together. The number of ribs is a user selectable variable. Printing of airfoils is

done one at a time when done directly from Wingmaster. Airfoil ribs can be printed or plotted with skin correction and spars noted in place. Spar cap width and thickness are specified by the user.

The installation on my 386SX-25 took about 20 minutes but only about four minutes on a 486-33 laptop. Operation on the 386 with 2 MB of RAM was slow with plenty of disk swapping going on. On the 486 laptop computer with 8 MB, operation was fast.

Documentation:

The impressive manual has 70 spiral

bound, magazine quality pages, a table of contents, a short index and appendix. The appendix contains plots of the airfoils provided. Wing platform descriptions are provided for a number of full size planes. The manual has a few examples which were very helpful. Technical support is through a phone number where you can leave a message, or send your fax message.

Wingmaster is available at the introductory price of \$99 from Websoft, Inc., 87 Cottonwood Rd., Pryor, OK 7436. The regular price will be \$129. ■



ZIKA

Understanding Sailplanes

...by Martin Simons

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Flight Without Figuring I

We fly for fun. It is not absolutely necessary to understand the science of flight in order to control a model aeroplane, glider or helicopter. Many people who drive cars successfully know nothing about how the engines work. One can drive merely by practising the skills required. Soon actions become automatic and are performed without thinking. Model flying is the same. A well programmed robot could probably do a better job of piloting a model than a human being can.

The robot wouldn't get much enjoyment out of it, though. Understanding how the model flies and how it might be improved, makes our sport more interesting. Such knowledge by itself certainly does not make anyone a world champion, but it probably does make a pilot who has more fun.

In this series of short articles we shall look at the basics of model flight, without mathematics. It may be necessary to use the occasional decimal figure or graphical diagram, but no more. I have occasionally been criticised for leaving out the equations from some of my previous writings. There are some professional aerodynamicists who maintain the mathematical approach is essential. I hope to demonstrate otherwise. The first step in understanding the basics of flight, is to get the ideas clear. Mathematics can be very illuminating after that, if used with sound judgment.

I will mention two cases where mathematics has led people seriously astray. A few years ago I received in the post a

dozen pages of calculus. These purported to provide a method of working out the conditions for an aeroplane to have the minimum possible drag. I was suspicious, since the conclusion was completely at variance with the standard results. What my correspondent had actually done was to prove that an aeroplane has minimum drag when it has zero airspeed. That is correct but not very helpful and we didn't need calculus to tell us. This writer, lost in sophisticated mathematical reasoning, had not grasped the first principle. An aeroplane has to have some airspeed to fly at all.

My second example comes from an article about five years ago in a highly respected American model magazine. This was well sprinkled with words like 'momentum' and 'inertia'. Lengthy equations were introduced. The upshot was a table which demonstrated that a model aeroplane turning into a moderate breeze when making a landing approach, would necessarily, and always, gain energy and shoot up about 40 metres (130 ft.).

If this were true, we should never be able to land a model aeroplane into wind at all because every time we turned towards the intended touch down, it would go up again. This is obvious nonsense. The algebra was not wrong, but the scientific terms and laws of motion had been totally misunderstood and the whole basis of the work was false. Yet the equations evidently deceived the magazine editor and the nonsense was published.

Other examples of a similar kind could be found without much difficulty. Beware of charlatans.

The basis of flight

It is generally understood that any aeroplane or glider is normally supported in flight by its wings. The action of gravity on the mass of the aircraft, producing the force we term weight, has to be op-

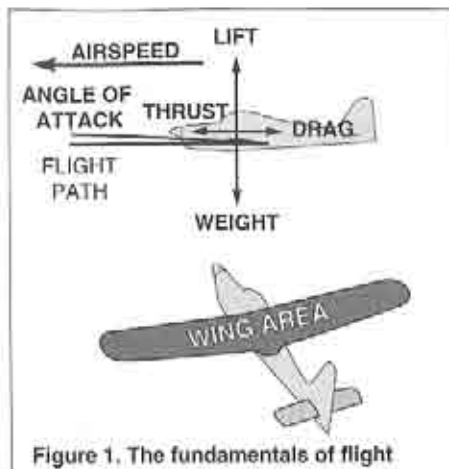


Figure 1. The fundamentals of flight

To overcome drag the wing must be driven by some form of energy. In the case of powered aircraft the engine provides thrust. Gliders, or aeroplanes with motors stopped, obtain their thrust by inclining their flight path downwards at some gliding angle. Gravity pulls them forward in much the same way as a free-wheeling bicycle or car rolls forwards and down a slope.

The fundamentals of flight are, therefore, **lift, wing area, angle of attack, airspeed, drag and thrust** (Figure 1). Some of these are fixed by the design of the aircraft. Wing area, for instance, is

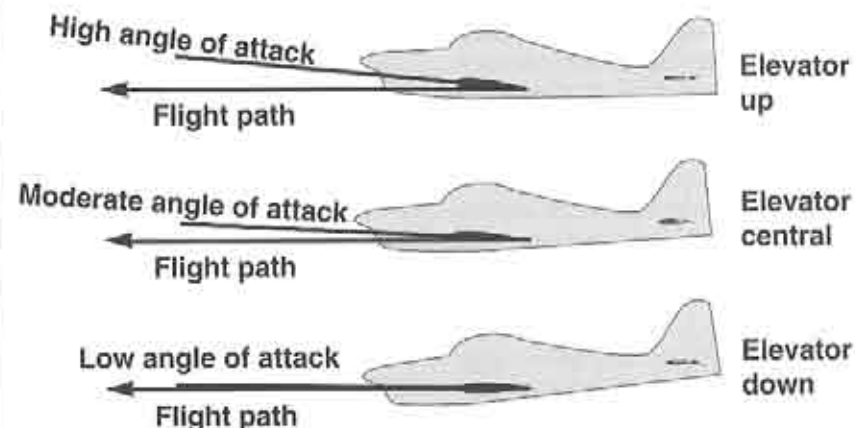


Figure 2. The elevator controls the angle of attack

posed by an upward reaction from the air. Wings are designed to produce this support, the force called lift. To obtain lift from what is merely a fluid mixture of invisible gases, the wings, which have a large area when viewed in plan, have to move at some airspeed, and meet the resulting flow at a suitable angle, called the angle of attack. Flight is possible when the wing area, airspeed and angle of attack are adjusted to produce the necessary upward reaction force.

Motion through a fluid like air is impossible without creating resistance, or drag,

unalterable on most simple model aeroplanes, although variable geometry wings may be used, as on some full-sized aircraft. At a given speed of airflow, the maximum lifting force that can be obtained from a wing depends chiefly on its area. Other things being equal, the larger the wing area is, the more load it will be able to support. A jet airliner weighing 300 tonnes needs more wing area than a business jet aeroplane of 70 tonnes, although they fly at comparable speeds and have generally similar aerodynamic layout.

The other basic factors are under the control of the pilot to some extent, although there are usually some limits.

The thrust is variable from zero, with the engine stopped, up to the maximum possible from the given power unit, which is a limiting factor. When a powered model dives, gravity assists the motor. When climbing, gravity opposes the thrust.

When gliding, to keep the wing moving, a certain downward glide path must be maintained, and this represents a limit. Relative to the air, gliding flight is necessarily downwards, but it is possible to gain height if an upcurrent can be found which rises faster than the rate of descent, or sinking speed, of the glider.

The angle of attack is under the pilot's control, usually by means of the elevator, a movable surface forming part of the tail unit (Figure 2). There are limits to the power of the elevator and some extreme angles of attack cannot be attained. Within these limits, raising the elevator increases the angle of attack, lowering the elevator decreases it. The elevator may be adjusted by small amounts to trim the angle of attack. Used more coarsely, the elevator is the chief control for manoeuvring or pitching the aircraft in the longitudinal sense, nose up and nose down. If the aircraft is correctly designed and stable, response to the elevator is smooth and predictable in all normal attitudes of flight.

(The controls seem reversed when a radio controlled model is flying upside down. However, to raise the nose still requires the elevator to move up, and vice versa. Because the model is inverted, raising the elevator requires the control stick to be moved forward.)

Other methods of controlling the angle of attack are sometimes used, either alone or in conjunction with a normal elevator.

In steady, straight and level flight, the total lift equals the weight and the thrust

equals the drag (Figure 3). If the thrust is increased, the airspeed will increase, but the increased speed causes a rapid rise in drag, which soon grows to equal the thrust again and the airspeed settles to its new, higher figure. At the same time, if the flight is to continue level at the new speed, the angle at which the wing meets the air, its angle of attack, will have to be trimmed to bring the lift into equality with the weight.

If the airspeed is increased without re-trimming the angle of attack, the lift will exceed the weight and the aircraft will rear upwards in the beginning of a loop. Similarly, a reduction in thrust will cause a slowing of airspeed, necessitating an increased angle of attack to maintain the lift. If not done, the aircraft will lose height.

Wings

Almost anything can act as a wing, in the sense that any object moving through the air can be made to supply an upward force. Long, narrow bodies, like fuselages or airship hulls, can provide some lift if suitably angled to the airflow. Some motor cars and motor boats will raise themselves aerodynamically when going fast. They are commonly fitted with 'wings' to 'lift' downwards to prevent them taking off. A wing is capable of providing lift from the air without excessive drag.

Practical experiments and calculations have established most of the requirements. New advances are still being made. Examples are such things as the tip winglets added now to some well known aircraft. Research results on these devices were first published over fifteen years ago. There is much interest now in crescent shaped wings, resembling the shape of the new moon with outer panels curved back and pointed tips. Perhaps these, too, will become more generally adopted soon, if their claimed superiority is truly demonstrated in flight. None-

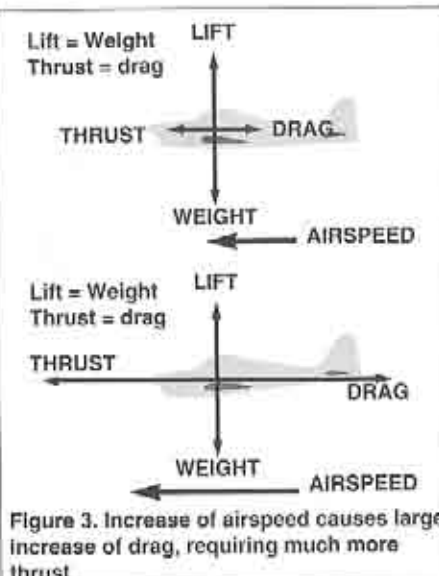


Figure 3. Increase of airspeed causes large increase of drag, requiring much more thrust

theless, the basic principles of wing design have not changed and are not likely to change essentially.

Ordinary aeroplanes have stabilising and controlling surfaces, tailplanes or canard foreplanes, and fins. These are merely small wings, so everything said about wings in general applies to these also. In helicopters the blades of the rotor are essentially wings, as are the blades of an ordinary propeller. In these cases the airspeed relative to the blades is created by rotation. Hence, understanding how a simple wing works gives some insight also into the operation of rotors and propellers.

Streamlined and separated airflow

The flow of air around any object may be irregular and turbulent, with many whirls or vortices. This is called **separated flow**. A good example is the flow behind a large, square shaped vehicle such as a furniture van or semi trailer with a full load. The air may follow the shape fairly well over the forepart but there is a long disturbed wake. The resistance or drag is large (Figure 4). It is not possible for the air to flow smoothly round a square corner. The air separates in a series of spin-



Figure 4. Separated airflow behind a moving truck

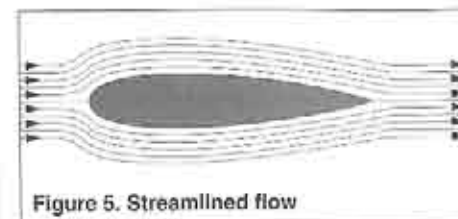


Figure 5. Streamlined flow

ning whirls or vortices, which draw their energy indirectly from the truck motor.

Some improvement is made by fitting curved deflecting plates over the cab of some large trucks. The air is guided more smoothly round the sharp corners at the front of the main load. The main drag, however, comes from the separated flow behind the trailer.

For anything to move through a fluid, such as air or water, with little resistance, requires the flow to remain close to the surface and smooth. Such flow is **streamlined**. Objects which are capable of moving through the air, or any fluid, without creating flow separation, are always made with long, gradually tapering tails, like fish, bird bodies, airships and aeroplane fuselages (Figure 5). The front end may be fairly bluff, although it should be smooth, without sudden changes of outline. A projecting windscreen or engine cylinder on a fuselage, for instance, causes some disturbance and such irregularities should be avoided if possible. They increase the drag, but the main flow stream can usually over ride and re-attach to the surface behind them. The greatest care has to be applied to the after part because the danger of flow separation is greatest here and general separation causes very large drag increases.

It is particularly vital that the airflow over and under a wing, should remain streamlined. For this reason, the basic shape of a wing in cross section, the wing profile, or aerofoil section, is invariably of a streamlined shape. It is also important that the flow should remain stream-

lined over the whole range of angles of attack that will be used in flight. To develop wing sections which will allow this, has been one of the chief occupations of research engineers in aviation. More will be said on this in later articles.

1994 Tangerine Soaring Championship

...by Don Cleveland
Orlando Buzzards
Casselberry, Florida

The Orlando Buzzards Soaring society could not have ordered better weather conditions for the 21st Tangerine Soaring Championship. Bright sun and temperatures in the mid 70's prevailed all three days with very light winds from the east. The three-day championship began on the Friday following Thanksgiving at the Little Big Econ State Forest (special thanks to the Florida Department of Forestry). The championship site, which was used for the first time, was 40 acres of mowed launch/landing area surrounded by an additional 200 acres of flat grassy area. Hurricane Gordon dumped 11 inches of rain the week before the championship and left the ground somewhat soft. I saw Fred "Cornfed" Rettig go from a pair of rubber boots to bare feet which I suspect is natural for him. Trying to deal with the soft conditions was difficult, but everyone soon adjusted to the soft ground while soaring in perfect weather conditions.

To commensurate the 21st Tangerine Championship, Red Hill Groves of Orlando donated a large bag of tangerines to all contestants. Tom Jones of Zoomit Creations had a variety of beautiful T-shirts available including the 1994 Tangerine Soaring Championship T-shirt. Copies of the latest issue of *Model Airplane News* were also available for all

contestants. On Sunday, Velma Goodwin supplied fliers and spectators with her famous chocolate chip cookies.

Friday's contest was designated as 2 meter thermal duration. Contest director Julius Wagner started the event with approximately 60 pilots representing 14 states. As previously announced, fliers were divided into sportsman and expert/master classes. Six tasks were flown with 7 minute thermal duration; landing points of 25, 50, and 75 were awarded. Three winches were used in the open winch competition and each round was easily completed in one hour and 15 minutes. Excellent thermal conditions on Friday enabled many fliers to post times around the seven minute duration and provided very close competition among the two classes. The highlight of Friday's competition was a "heads-up" fly-off for 3rd and 4th place in the expert/masters class; competing were Ray Alonzo, President of Florida's Soaring Association,



Trey Wood accepts Sportsman winner plaque from Ed White.



Tom Jones 2m Expert/
Master Champion.



Tom Jones ready to launch his "Intimator"

and Jim Thomas from Seattle, Washington. Jim won the fly-off by less than one second for third place. Excellent flying by both contestants provided a thrilling finish to a great day for everyone.

Saturday started as just another "typical" Florida day with warm temperatures and plenty of thermals in the air. Contest Director, Cy Baylor, started the unlimited competition promptly at 9:45 a.m. with 78 fliers entered. The task for Saturday's competition was designated as 6 rounds of 8 minute duration with

landing points of 25, 50, and 75. Again, conditions were just right for excellent flying and provided the opportunity for very competitive rounds among the fliers. Just like Friday's competition, Saturday's contest results also ended in a tie and required another "heads-up" fly-off. Tom Jones from Carrollton, Texas and Jim Thomas, who was in Friday's fly-off, were required to go "heads-up". Jim, again, came out on top to take second place in the expert/masters class. Sunday's event was directed by Ed White,



Jim Thomas accepts Sunday's Expert/Master class from Ed White.



Rick Eckel accepts 2nd first place sportsman from Julius Wagner.



John Agnew, 2nd place Sunday, Unlimited, Expert/Master class, with Ed White.

President of the Orlando Buzzards. Again, sunny skies and warm temperatures dominated, but the winds began to pick up. The task for the 76 pilots was a 5 minute round and four 8 minute rounds with 25, 50, and 75 points. Although thermals were not plentiful as the previous two days, the contest was just as competitive with very few points separating the winners.

While the final scores were being tabulated, a drawing for door prizes was held with all contes-

tants having the option of picking any single item on the table as their tickets were drawn. After the door prizes were awarded, a raffle was conducted for a Futaba computer radio, an Esteem 110" sailplane kit, a Spectrum sailplane kit, Airtronics Micron Servos, and a Cool Solar Hat. The Orlando Buzzards sincerely appreciate the generosity and support of all contributors, with special thanks to Futaba, Inventec Corporation, Slegers International, Airtronics, and Rick Swineford. The door prizes were donated by Composite Structures Technology, B2 Streamlines, Coverite, Cox Hobbies Inc., Edjer, Fiberlay, Hobby Lobby International, Model Airplane News, Pierce Aero Co., Dave Thornburg, RCSD, RnR Products, Rocket City R/C

Specialties, SIG Manufacturing, SR Batteries, Sullivan Products, Windsor Propeller Co., and TNR (The Battery Store).

Following the raffle, Ed White presented beautiful plaques with an inset Tangerine logo to Sunday's winners. Jim Thomas provided the day's highlight, as he

1994 Tangerine Soaring Championship

Jim Thomas - 1994 Grand Champion

Sportsman **Expert/Master**

Friday

- | | |
|------------------|-------------------|
| 1. Rick Eckel | 1. Tom Jones |
| 2. Terry Fallow | 2. Derek Khaw |
| 3. Mark Kummerow | 3. Jim Thomas |
| 4. Trey Wood | 4. Ray Alonzo |
| 5. Jay Galyon | 5. Charles Brecht |

Saturday

- | | |
|------------------|---------------|
| 1. Jay Galyon | 1. T. Rogers |
| 2. B. Lawless | 2. Jim Thomas |
| 3. Mark Kummerow | 3. Tom Jones |
| 4. Trey Woods | 4. Ray Alonzo |
| 5. Jack Barker | 5. J. Timick |

Sunday

- | | |
|------------------|----------------|
| 1. Trey Wood | 1. Jim Thomas |
| 2. Mark Kummerow | 2. John Agnew |
| 3. B. Lawless | 3. Tom Jones |
| 4. B. Carroll | 4. Derek Khaw |
| 5. Jay Galyon | 5. Fred Rettig |

was awarded the 1994 Grand Champion Trophy for total overall points in the three day championship.

Make plans now to compete in the 22nd Tangerine Soaring championships to be held in Orlando, Florida on November 24, 25, and 26, 1995. ■

SMG Model Sailplane Catalog and Book by Walter Gerten

...Reviewed by Lee Murray
1300 Bay Ridge Road
Appleton, Wisconsin 54915
(414) 731-4848

I received a disk from Judy Slates with the request to find a way for her to view at least the text of a program sent to her by Dr. (Doc) Ameil Klein an RCSD contributor from Germany. You see, the disc is an IBM PC / Microsoft Windows 3.1 application and RCSD has a Macintosh and not the brand new Power PC which would run software from either format.

Many of the disc files were Windows graphic *.BMP files of sailplanes and electric sailplanes. The text was part of a windows application program. I eventually found an executable file "smgbuch.hlp" which, when launched by Windows Program Manager, springs to life the most wonderful sailplane catalog and reference book you might imagine... Well almost! You see it is in German with a few words in English. This is still great if you understand technical German, but not so good if you cannot. My German is not so good but I can describe the software. The program is put out by Walter Gerten of SMG Sailplanes. He had the assistance of Jürgen Beling, a computer specialist from Trier University. The



Segelflugmodelle
Gerten

Walter Gerten, Edinger Berg 5 54310 Röllingen
Tel 06585-531
Konto Post giro Köln Nr 416666-507 Bkz 3701005C

MODELLSEGELFLUG (Auflage 2 / 1994)

Produkt- und
Themenbesprechung

Einleitung, Copyright
Zur Verwendung
Fluganimation

SMG - KATALOG

SMG - FACHBUCH Themen:
BAUEN - TRIMMEN - FLIEGEN
AERODYNAMIK - KONSTRUKTION

Inhaltsverzeichnis SMG-Fachbuch Bereich Bauen-Trimmen-Fliegen
zum Bereich Aerodynamik

- C. Montageanleitung; Beispiel
- C.1 Weitergehende Montage- und Finish-Tips
 - C.1.1 Rumpf
 - C.1.2 Tragflächen und Leitwerke
- D. Weitergehende Tips zur Trimmung und Steuerung
- D.1 Segler
 - D.1.1 Einfliegen
 - D.1.2 Schwerpunktauswahl u. Höhenrudertimmung
 - D.1.3 Strömungsabriss
 - D.1.4 Exponential- Dual- Rate- Ausschläge
 - D.1.5 Differenzierung
 - D.1.6 Wölbklappenabnutzung
 - D.1.7 Landehilfen
 - D.1.8 Starthilfen
- D.2 Elektroflug
 - D.2.1 Ausrüstung
 - D.2.2 Antriebsbeispiele
 - D.2.3 Einbau, Fliegen
 - D.2.4 Laden, Pflegen

ARA

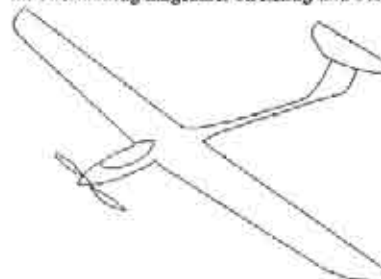
Modellbeschreibung ARA

ARA Segler-Elektrosogler

Die Entwurfsvorgabe für diesen relativ kleinen Segler war:
Größtmöglicher Leistungsbereich bei kleinstmöglichen Abmessungen.

Die Entwicklung des Profils, der Tragflächen-, Klappen- und Leitwerksgeometrie führte zu einem Modell, das ansprechende Leistungen vom schnellen Kunstflug bis zum langsamen Thermikreisen zeigt.

In beiden Bereichen können die durchgehenden Wölbklappen eine weitere Verbesserung bewirken. (Im Kunstflug höhere Rollwendigkeit, Geschwindigkeit und sichere Rückenfluglage, im Thermikflug langsamer Kreisflug und besseres Steigen.) Wohlgermerkt wurde auf eine Spezialisierung auf bestimmte Einsatzgebiete verzichtet, um echten Allroundeinsatz zu ermöglichen.



Dadurch müssen bspw. gegenüber einem speziellen Thermikmodell natürlich Leistungsabstriche in Kauf genommen werden, die aber durch andere Modelleigenschaften wieder ausgeglichen werden.

ARA bietet schon bei schwachem Wind am Hang ein unerwartetes Potential. Vielfach lassen sich durch die enorme Wendigkeit enge

Aufwindfelder leichter ausfliegen als mit größeren Modellen. Aufgrund der direkten, exakten Steuerreaktionen und der fehlenden Trägheit bereitet das Modell totalen Segelfluggenuß.

Durch die gute Richtungsstabilität und das neutrale Verhalten ergibt sich im schnellen Gleitflug und auch bei böigem Wind eine ruhige Fluglage.

Aufgrund der widerstandsarmen Auslegung lassen sich auch schwierige Figuren wie stehende Acht und senkrechte Rollen fliegen.

"ARA 25" verwendet als Allroundversion das Profil HQ 2,5/10mod (geteilte Fläche; Hochkantstahl).

"ARA 15" ist mit dem etwas schnelleren Profil HQ 1,5/8m ausgerüstet und stärker Hang-Kunstflug orientiert; zeigt aber dennoch erstaunliche Thermikeigenschaften (geteilte Fläche, Rundstahl).

Das Überziehverhalten ist unkritisch, auch im langsamen Landeanflug verhält sich der Segler gutmütig.

Das Modell läßt sich ohne Nachteile auch ohne Seitenrudernlenkung fliegen, so daß in diesem Fall nur ein Servo im Rumpf montiert wird. Die Querruder-Wölbklappen werden von je einem

resulting program is quite impressive. To quote from Dr. Klein:

"In addition to giving full specs on all of the SMG models, Walter goes into detail about each model's design. In addition, there is abundant information on design and construction, in general, as well as all the recognized formulas and parameters... He cov-

ers things like model set up, transmitter set up, and building tips. And for those who want or need more information, there are explanations for all the terminology and a bibliography of the German books relating to sailplane design and building."

Dr. Klein suggests that people make copies for personal use so they can glean the

Servo in den Tragflächen angesteuert.

Es ist problemlos möglich, das Modell für Elektroflug von 7 bis 10 Zellen zu verwenden. Für größeren Platzbedarf beim Elektroflug ist ein 14-Zellen-Rumpf erhältlich.

Bauweise:

Der Rumpf wird aus Epoxidharz und mehrlagigem Glasgewebe im Naß-in-Naß-Verfahren gefertigt und getempert, (eingefärbt). Die Höhenruderrippe (Pendel-T-Leitwerk) ist spielfrei gelagert und mittels Bowdenzug direkt angelenkt. (Auf Zug belastet) Das Seitenruder ist einseitig befestigt und innenliegend angelenkt.

Die Tragflächen sind geteilt Verbindung mit Hochkantstahl). Bauweise: Styrokerne mit Holz, Glasgewebeerstärkungen und Furnierbeplankung; Verklebung mit Epoxidharz, getempert. Wurzelrippen, Randbogen und Verbindungselemente sind fertig eingebaut. Die Nasenleisten (Hartholz) und Querruder sind vorgefräst.

Die Flächen werden auf dem Rumpf mit Nylonschrauben befestigt, ebenso das Höhenleitwerk auf der Wippe. Sämtliche zur Fertigstellung des Modells benötigten Teile sowie eine ausführliche Anleitung (auch für Elektroeinbau) liegen bei.

Technische Änderungen sind vorbehalten.

Technische Daten

Spannweite	1900mm
Länge	1080mm
Profil	HQ 2,5/10m bzw. HQ 1,5/8m
Flügelfläche	34,1 qdm
Höhenleitwerk	4,5 qdm
Fluggewicht ab Segler	1050 g
Fluggewicht ab Elektro	1450 g

Modellberechnung

Datum: 01.02.1992

Modellname: **ARA 15** Entwurf: Walter Gurtm

(mm) bzw. (g) Profil: HQ1,5/8 III-Spannweite: 420

technical information and enjoy the graphics. If you write to me I will send you a copy of the disc. Please send a SASE with 2 stamps and a HD 3.5" disc. I will copy the contents onto your disc and return it with some instructions on running the program.

The program allows one to access the

information in several ways.

- A title page with key words which when clicked on produce the information in that category.
- Outlines with key words which when clicked on produce the information on that topic.

Spannweite:	1900	Rekrüsch?	0000	Innenleite:	130
Wurzelsiefe:	230	Del?	0,6	Außenleite:	90
Zwischenleite:		Nullauftrieb:	1,3	Leitwähel:	719
Außenleite:	100	Profiltrommel:	0,05	Fluggewicht:	1500

Schwerpunkt bei Cav=0,5	Schwerpunkt bei Cav=1,0	Schwerpunkt bei Cav=66,04	Flügelfläche qdm:	37,05	Notakce III:	0,461155827
bei m/h:	33	%	198,12		Russwidend:	0,000
		Kontrollleite (CaE) -95,00	mm:	193,00	Kontrollleite (CaE):	0,48
		% 47,95	Streckung 9,74		Fläche III:	6,62
		NF-Strecklänge %:	14,62	Flächenbetrag:	Streckung III:	3,32

Ca	Cwp ²	Resid	Cwges	Ind Widerst.	V (m/s)	Re aufba (s)	RWD
		bei (mm)	Cw				
0,10,0073	951006	0,0136	0,000334523	25,71	288004	-0,63	
0,20,0083	248199	0,0150	0,00133469	19,18	203650	0,20	
0,30,0086	202654	0,0176	0,003001704	14,85	166280	1,08	
0,40,0094	175503	0,0207	0,00533262	12,86	144003	1,99	
0,50,0103	156975	0,0240	0,008138665	11,50	128800	2,74	
0,60,0116	143298	0,0298	0,012008814	10,50	117578	3,29	
0,70,0144	132668	0,0367	0,016942698	9,72	108856	4,44	
0,80,0162	124100	0,0433	0,021345447	9,09	101923	5,29	
0,90,0198	117002	0,0529	0,027015232	8,57	96902	6,14	
1		116998	0,0394	0,033322261	8,13	91073	6,99
1,1	105832	0,0464	0,040358236	7,75	86811	7,81	
1,2	101327	0,054	0,048027256	7,42	83140	8,69	

Ca	Qlennikel	Ca	Sinkgeschw (m/sec)
0,17,33		0,1	3,31
0,212,79		0,2	3,41
0,317,94		0,3	0,87
0,419,20		0,4	0,67
0,520,29		0,5	0,57
0,620,27		0,6	0,52
0,719,05		0,7	0,51
0,818,37		0,8	0,49
0,917,04		0,9	0,50

Die Leistungsdaten sind ein Durchschnittswert!

Gewichte (Nüßwert) g	ARA 15	ARA 23
Tragflächenhülle roh	220	200
Höhenleitwerk roh	40	40
Rumpf roh (ohne Flächenteile)	190	190
Fahrlöcher (Verbaugungsteile, Kleinteile)	60	40
Fluggewicht (je nach Einbau, Ausüstung und Aufbau ca.)		
7-Zellen 1,4-1,7 Ak: 230g-Motor	1500	1450
10-Zellen 1,4-1,7 Ak: 400g-Motor	1850	1800

- Search lists which load files to display the products a digital photograph (some in color), drawings of the model and its features, pages of technical information, including performance data (tables of lift, drag components, sinking rate, flying speed and L/D ratio), weights, dimensions, airfoils.
- Help files which direct you to information.
- A diagram in "Help" of a model with the dimensional parameter symbols illustrated.
- Glossary of technical terms and symbols.

Modellberechnung

Datum: 01.02.1995

Modellname: **ARA 25** Entwurf: Walter Göttsche

(mm) bzw. (g)	Profil:	HQ2510	HL-Spann:	420
Spannweite: 1900	Rekordwert:	00000	Innenweite:	130
Wingchord: 230	CaF2:	0,6	Achsenhöhe:	90
Zwischenbau:	Nullauftrieb:	3	Lehrhöhe:	719
Außenhöhe: 160	Profilnummer:	0,05	Flügelvord.	1450
Schwanzfl. für Ca=0,5	Schwanzfl. Ca: 0,6604	Flügeloberfl.	37,05	Defaktor HL: 0,461155687
bei mF(4): 35	%: 33,33	mF(4): 198,12	Reibkoeffiz.	0,009
Schwanzfl. für Ca=1,0	Neutralität (Ca): 0,500	tau: 195,00	Korrektureffiz.	0,98
bei mF(4): 30	%: 47,95	Steigung: 9,74	Fläche HL:	4,62
	NP-Rücklage %:	14,62	Flächenbelastg.:	39,14
			Steigung HL:	1,82

Ca	CwpT	Result bei (mm)	Cvgen	Ind. Wert 0	V (m/s)	Re anhm (m)	RWD
0,10,0082	945107	0,0148	0,000333523	25,29	283164	-2,13	
0,20,0086	244027	0,0159	0,00133409	17,88	200228	-1,30	
0,30,0093	199247	0,0183	0,003001704	14,60	163485	-0,65	
0,40,0094	172553	0,0207	0,005336362	12,64	141982	0,40	
0,50,0108	154938	0,0251	0,009339065	11,31	126635	1,24	
0,60,0114	146889	0,0294	0,012006814	10,32	113691	2,09	
0,70,0121	139038	0,0344	0,016342608	9,56	107026	2,94	
0,80,0138	122914	0,0411	0,021343447	8,94	100114	3,79	
0,90,017	113056	0,05	0,027015332	8,43	94888	4,64	
1	0,026	109132	0,0654	0,033352261	8,00	89244	5,49

Ca	Glühwinkel	Ca	Sinkgeschw. (m/sec)
0,10,74		0,1	3,73
0,212,35		0,2	1,42
0,316,30		0,3	0,89
0,419,20		0,4	0,66
0,519,89		0,5	0,57
0,620,40		0,6	0,51
0,720,32		0,7	0,47
0,819,41		0,8	0,46
0,917,99		0,9	0,47
1	18,30	1	0,52

- Price lists (Deutsche marks) of SMG products.
- A Windows clipboard for moving things to another application.
- A print topic option.

The illustrations of the title page, and model data are included. ■



INTERNATIONAL



All Designs © 1995
by Paul Naton

Hand Launch Glider Festival '95

...by Ron Scharck, C.D.
7319 Olivetas Ave.
La Jolla, CA 92037
(619) 454-4900

The Torrey Pines Gulls' of San Diego, California will sponsor the second International Hand Launch Glider Festival on Saturday and Sunday, May 20 - 21. That's right... Two days of flying the most interesting and demanding HLG tasks against some of the best pilots in the world in a beautiful country setting just outside of San Diego. A world class

event in a world class setting.

When the idea of a two day HLG contest was introduced last year, some of the most seasoned HLG aficionados questioned about the format said, "No Way! The arms won't last two days of contest throwing."

Thanks to Steve Stricklett, Steve Condon and a couple of other HLG junkies, TPG was convinced to give this outrageous concept a toss. (Pun intended!)

And so was created the International Hand Launch Glider Festival.

In spite of the doubts generated by the

two day schedule that included 10 rounds plus 3 fly-off rounds, the 1994 International Hand Launch Glider Festival was a big success. Joe Wurts, former world champion, and current IHLGF champion summed it up when he said, "This was the best hand launch contest I have ever flown in." Ben Clerx assessed the two day event as, "A fun contest that challenged a pilots tactical skill as well as his thermal flying abilities... tested these skills to the extreme." Scott Smith, RCSD's HLG columnist wrote of the IHLGF, "Truly this was a contest of champions... an inspiration to prepare for next years contest. I can hardly wait!" Inspired by these and a host of other complementary statements, TPG proceeded full speed to make the IHLGF an annual celebration of the

great sport of R/CHLG.

This year's International Hand Launch Glider Festival (IHLGF) will, as last year, consist of 10 rounds of competition to determine the top 10 pilots followed by a 3 round fly-off which will pit the top 10 pilots against one another to determine the final standings and the 1995 IHLGF champion. With 10 of the worlds finest HLG pilots flying three rounds of the more difficult tasks for the championship, you can imagine what intense and exciting competition the fly-off generates. For those not in the fly-off, the spectacle of watching these great pilot/athletes stretch the limits of their abilities is in itself a study in the art of hand launch gliding.

The real purpose of the International Hand Launch Glider Festival is to bring those who love to fly hand launch gliders together for two days of fun in one of the most beautiful places on earth, San Diego, California. The fact that there also happens to be some very intense competition is not purely coincidental.

In order to make your trip to San Diego and the International Hand Launch Glider Festival one of the highlights of your soaring career, the Torrey Pines Gulls' have designed ten rounds of competition that will keep you involved and excited. As a matter of fact, a number of the tasks are so interesting that even when you are not competing you will probably be studying the strategy and techniques of the other pilots.

For example, to start things off on Saturday morning and to give you a chance to warm up the old arm, the first task is called the "Gun Slinger". For the benefit of our international friends and those of you located on the east coast, a "Gun Slinger", as portrayed in the movies, had to be really quick on the draw and accurate with his shot. Otherwise he/she would be a former gunslinger. The objective of this task is to log the greatest

number of flights with increasing times, within a ten minute window, with the first flight being at least 15 seconds in duration. The optimum goal is to have a 15 second first flight, followed by a 16 second flight, followed by a 17 second flight, etc., etc., etc., until the ten minute window runs its course. There is no limit to the number of throws you may take. By the way, the goal is a possible 21 flights. Can you now understand why it is called the "Gun Slinger"?

As you can see, the "Gun Slinger" event requires that the pilot have exceptional control of his aircraft to be able to launch, land/catch, and relaunch his craft at the precise time required. What is not required in this event is a strong arm or thermal activity. Are we having fun yet?

Another interesting and popular event is called the "Sum of Increasing Flights". This task, framed within a 10 minute time window, requires the pilot to accumulate as much flight time as possible under the following restrictions: there must be at least three launches; the flight time of the first launch must be at least 15 seconds; in order for the following launch flight time to be counted it must be longer than the previous flight time. So, if your first launch results in a flight time of 16 seconds, the next flight time must be at least 17 seconds to be counted, etc., etc.

Sounds simple... right? Well, maybe! Consider that you hook one of those phantom (sucker) thermals during your third flight and you are convinced that with your superior thermalling skills you will be able to wait it out until it develops into that "stairway to heaven". However, in spite of your thermalling skills, about 2 minutes into the flight the phantom disappears and the next thing you know you have your plane in your hand and your timer is writing 2:04 into the third slot on your score card. Guess what? Your next flight time must be 2:05, or longer, to count. Trust me - this can be

an eternity! As you have probably surmised, the "Sum of the Flights" task combines piloting skills, athletic skills and strategy. Practice this task at your local HLG field and see if you don't agree that this is a very interesting task.

While the two events outlined above resemble each other, I challenge you to try them out and see how truly different they are. Speaking of different events, of the first ten rounds of the IHLGF competition, there are eight different tasks and each of the three championship rounds is different from any of the first ten rounds. So if you happen to qualify for the championship rounds you will fly eleven different tasks.

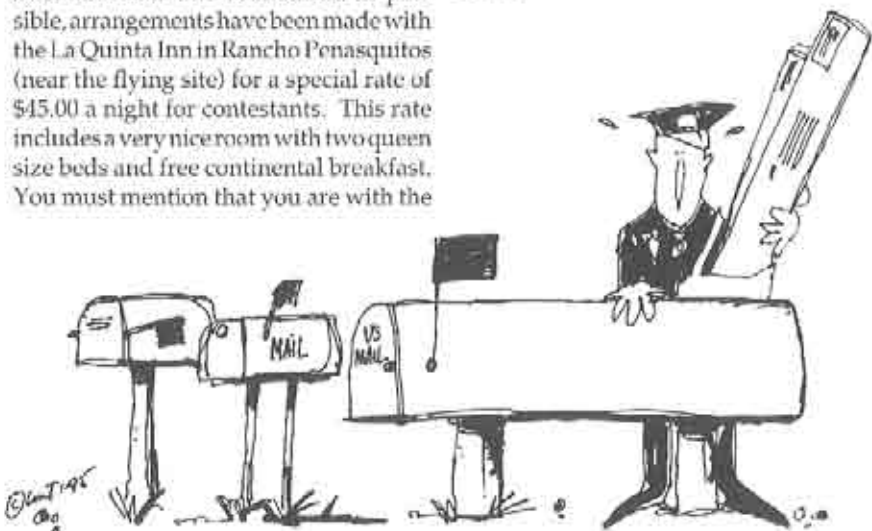
One of the most popular events at the IHLGF is the Saturday evening barbecue which is catered by Tony Roma's (Pacific Beach). The rib and chicken combination, together with baked beans, corn on-the-cob and cold slaw proved to be quite a crowd pleaser last year. The plan for '95 is "more of the same"!

In order to make your stay in San Diego as comfortable and economical as possible, arrangements have been made with the La Quinta Inn in Rancho Penasquitos (near the flying site) for a special rate of \$45.00 a night for contestants. This rate includes a very nice room with two queen size beds and free continental breakfast. You must mention that you are with the

International Hand Launch Glider Festival in order to receive these rates. It is imperative that you make your own reservations. See contest application for reservation details.

Pre-registration to the International Hand Launch Glider Festival is highly recommended. If registration is made on or before May 15, the entry fee is \$20.00. Entry fee after May 15 is \$30.00. For more information on the IHLGF and/or an entry package, please contact Ron Scharck at the address and telephone number listed at the beginning of this article.

If you truly love flying hand launch gliders, the IHLGF is the place to be on May 20-21. If competing against some of the finest pilots in the world is a challenge you find exhilarating, the IHLGF is the place to be on May 20-21. If you aspire to being one of the best HLG pilots in the world there is no better format than to compete against the best in a world class championship contest...the International Hand Launch Glider Festival, May 20-21. ■



by Curt Nehring
San Dimas, California

Sanctioned By: The North American
Scale Soaring Association & AMA
**Wasatch Mountain Scale
Soaring Festival**

...from Bob Harman

(InterMountain Silent Flyers of
Salt Lake City, Utah)

Sandy, Utah

On July 21-24, 1995, the Wasatch Mountain Scale Soaring Festival will be held at "The Point of the Mountain". Scale, Power Slope Scale, and Open Fun Flying events will be held at thermal, cross country, and slope soaring sites in the beautiful Wasatch Range of The Rocky Mountains during Salt Lake City's locally celebrated Pioneer Days. The Festival Headquarters will be at the new Carriage House Hampton Inn Motel in Sandy, Utah. Pre-Register by 21 June 95, present your AMA and NASSA membership number to obtain a discount entrance fee, a discount motel rate, a choice of frequencies and Pilot Package. The package contains: motels, camping sites, climatic conditions, maps to the airport and to the sites, local points of interest, restaurants, hobby shops, events schedule, the Festival Social, Dinner, Raffle, Pilots Awards, Static Displays, Trade Show, Swap and Sell information. Register 30 days early as WMSSF participant to get your motel accommodations at a block discount rate. This is Utah's busiest summer weekend. Call the nearby (1-800-HAMPTON) or more economical Comfort and Sleep Inns (1-800-221-2222). A block of discount rooms only for WMSSF will be reserved. Also, order your festival dinner and or NASSA, IMSF, WMSSF T-Shirts in advance.

Utah is well known for its snow, "THE GREATEST SNOW ON EARTH", and many visitors come to the Rockies for a winter vacation to enjoy SKIING". Why not a summer vacation to the colorful Rockies for SCENIC Mountain SOARING? Utah might then be better known for "THE GREATEST SOARING ON EARTH"! All those who come to the NASSA and IMSF Club Wasatch Mountain Scale Soaring Festival will fly at our best soaring sites. Enjoy slope or ther-

mal soaring with a fun loving bunch of local and avid out of state flyers.

"The Early Bird Soaring Opener"

Friday, 21 July 1995, is the day to introduce visitors to slope soaring at our Point of the Mountain flying site. This activity will be a casual "OPEN" fly for any type slope or thermal sailplane. No fee or registration is required; but insurance is required. Camping is free at the Point of the Mountain.

The Festival

Two days of scale and PSS slope or thermal fun flying is scheduled for July 22-23. There will be a short slope cross country event over the two ridges at The Point of the Mountain, and a free style event high on top of Francis Peak. There will also be a casual buffet dinner and raffle.

Monday, July 24 is "Utah's Pioneer Day". Your choice of 3 simultaneous events at different flying sites are: Cross Country, Thermal, or Slope, weather permitting. These events require a Registration Fee and Proof of Insurance. You must pre-register and pay the entry fee to receive your PILOTS PACKAGE in the mail.

There will also be daily get together breakfasts at a designated meeting place, hot dogs and drinks at the sites. Scale Judging, Pilot awards, and static displays are at the Festival dinner or motel HQ.

Festival and NASSA T-shirts, caps & decals, swap/sell items, manufacturers and supplier trade displays are welcome with or without donated prizes for our raffle. We will provide show and tell space, allow on site demonstrations, and pass out your information sheets.

Stay all week, or just the weekend. Enjoy yourself soaring and sight seeing in the Utah Wasatch Mountain Range in the Rockies!

Contact Bob Harman (1-801-571-6406, days) for further information or pre-registration. Or contact Joe Welch (1-801-567-9760, nights). Joe's fax number is (801) 567-9542.

Mail to: Wasatch Mountain Scale Fun Fly Festival of Salt Lake City, Utah, 10424 Golden Willow Rd., Sandy, Utah 84070.

NEW PRODUCTS

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



AERO*COMP™ Version 3.0-E

...from USR&D Corporation

AERO*COMP™ is software to analyze the performance of electric-powered model aircraft. Use it to match motor, gearbox, prop, batteries, and aircraft design to obtain optimal airspeed, rate of climb, glide performance, or flight duration. Works with scratch-built models as well as with kits. Features database of 225 electric motors and database of 53 airfoils. Also features easy-to-use pull-down menus and detailed help screens that explain the inputs and results. Predictions are usually accurate within 5 percent.

AERO*COMP™ is used by aircraft designers worldwide. NASA and several major aircraft manufacturers use AERO*COMP™ to help design experimental aircraft. The software has been used by trophy winners at the U.S. and Canadian Nationals since 1992.

For further information, please contact USR&D Corporation, P.O. Box 753, Hackettstown, NJ 07840-0753; (908) 850-4131. ■



ZIKA

Soar Head.

SOARHEAD® Apparel

...from California Soaring Products
California Soaring Products, a "glider-only" hobby shop in Southern California, is now offering a complete line of SOARHEAD® Apparel. These T-shirts, visors, and baseball-style hats are bound to make a bold statement at any flying field.

Virtually shrink-proof, these new 50-50 short-sleeved shirts carry additional CSP graphics on the back and each sleeve. The washable headgear is fully adjustable, designed to keep you cool while protecting your face from the glare or bright sunlight, and displays only the SOARHEAD® logo. All silkscreen items are sailplane-white with cobalt blue lettering. The T-shirts are currently available in M, L, and XL sizes and priced at \$10.00 each plus \$3.50 S&H. Hats and visors are \$7.50. California residents need to add an additional 8.25% sales tax.

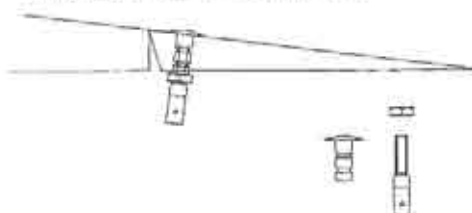
California Soaring Products accepts Visa, Mastercard, and Discover. Contact Paul Ikona at (818) 966-7215 or via fax on (818) 966-7915. For "orders only", CSP's toll free number is (800) 520-SOAR. ■

Aileron Horns

...from Brian Anderson

Looking for aileron horns for your new model? Brian Anderson of England has aileron horns that are machined in two parts, from brass. The carrier is bonded into the control surface. The adjustable horn is screwed into the carrier and locked into place with the lock nut.

Price is £1.20 per horn plus 40p. postage in U.K., and £1.00 postage to the U.S. For details, contact Brian Anderson, 206 Hilda Park, Chester le Street, County Durham, DH2 2JX, England. Phone is 091 3887649. ■

NASSA
NORTH AMERICAN
SCALE SOARING ASSOCIATION

The North American Scale Soaring Association is an organization of scale soaring enthusiasts dedicated to the furtherance and enjoyment of scale soaring in North America. Membership dues are \$10.00 a year or \$5.00 after August 1st, and provide for sponsorship of NASSA Scale Fun Flies & Rallies, and for the implementation of a National Scale Building and Soaring Achievement Program. Join NASSA and join a network of scale soaring enthusiasts that influence the direction of scale sailplanes in North America. Please provide your address, phone #, and AMA #, and we will send you a membership card and membership roster. A bi-monthly column keeping NASSA members up to date is included in *RCSO*, with additional information available periodically direct from NASSA. Help promote and support the continuation of scale soaring by sending \$10.00 (or \$5.00 after Aug. 1st) to: NASSA, P.O. Box 4267, W. Richland, WA 99352.

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

Reference Material

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



The Vintage Sailplane Association

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

Vintage Sailplane Association
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

1995 MIDWEST
CROSS COUNTRY
SOAR-IN RACE

National Flying Site
Muncie, Indiana
April 29 & 30, 1995
Sponsored By Greater Detroit
Soaring & Hiking Society
Registration Ends April 15, 1995
Contact Arthur E. Slagle C.D.
26314 Kiltarton
Farmington Hills, MI 48334
Or Call Evenings 810-477-2228

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 Edgeland Dr. SE, Huntsville, AL 35802; (205) 883-7831.

Arizona - Central Arizona Soaring League, Iain Gilthorpe, (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. Soaring Action, Pete Young, 6592 Belgrave Ave., Garden Grove, CA 92645-1802; (714) 892-3473.

California - Torrey Pines Gulls, Ron Scharck, 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).

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

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@aconrbbs.com>.

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

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.

Nebraska - B.F.P.L. Slopers, Steve Loudon (contact), RR2 Box 149 El, 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.

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 (H) (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.

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!"

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

Seminars & Workshops

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

BBS

BBS: SLOPETECH1, Southern California; (714) 525-7932, 14.4 baud - 8-N-1

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

Schedule of Special Events

Date	Event	Location	Contact
Mar. 11	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Mar. 12	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Mar. 18	Open Floater 2 CH Highstart, Open w/Winch Launch	San Antonio, TX	Gene Warner, (210) 732-3101
Apr. 8	TPG Unltd Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Apr. 8-9	Masters of Soaring	Covina, CA	Pete Olsen, (909) 597-2095
Apr. 9	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Apr. 15	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Apr. 23	Handlaunch	San Antonio, TX	Tom Meeks, (210) 590-3139
Apr. 29-30	XC SOAR-IN Race	Muncie, IN	Arthur Slagle, (810) 477-2228
May 5-6*	Rosebowl Soaring Festival	Pasadena, CA	Lynsel Miller, (408) 275-6403
May 5-7	Slope Scale Soar-In	Los Banos, CA	Eric Larson, (619) 793-7640
May 13	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
May 19-21	SIG/LASS Slope Race	Lucas, KS	Paul Wright, (402) 795-2012
May 20	Six Rounds of Open	San Antonio, TX	Jerry Caldwell, (210) 438-4077
May 20-21	Unltd. HLG Festival	Poway, CA	Ron Scharck, (619) 454-4900
May 20-21	Electric Fun Fly	Memphis, TN	Tom Ernst, (901) 767-9518
May 20-21	Spring Flng	Davis, CA	Joan Nolte, (916) 966-0857
May 27	SASS HL 1	Redmond, WA	Jim Thomas, (206) 488-2524
May 28	TPG/SC2 Therm. Cont.	Poway, CA	George Joy, (619) 748-2167
June 3-4	Kansas Flatland Open	Kansas	Ed Kempf, (913) 780-5543
June 10	TPG Unltd. Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
June 11	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
June 15-18	Mid-South Champs (International Contact)	Huntsville, AL	Ron Swinehart, (205) 883-7831 Tom Ernst, (901) 767-9518 George Joy, (619) 748-2167
June 18	TPG Thermal Contest	Poway, CA	Steve Stricklett, (619) 741-1037
June 24	TPG Fun-Fly & BBQ	Poway, CA	Perry Van, (210) 658-8842
June 24-25	TNT Open	San Antonio, TX	Art Markiewicz, (619) 753-3002
July 1	TPG HLG Contest	Poway, CA	Steve Stricklett, (619) 741-1037
July 8	TPG Fun-Fly & BBQ	Torrey Pines, CA	Jack Numm, (707) 728-4467
July 12-13	COGG XC Dash for Cash	Cookstown, Ontario	Neil Tinker, (416) 491-5823
July 14-16	Canadian Nationals	Barrie, Ontario	Mike Howell, (210) 657-3332
July 15	HL/Open	San Antonio, TX	Jim Thomas, (206) 488-2524
July 15-16	SOAR 95 (Unl, 2M)	Redmond, WA	George Joy, (619) 748-2167
July 16	TPG Thermal Contest	Poway, CA	Bob Harman, (801) 571-6406
July 21-24	Wasatch Mt. Scale/PSS Soaring Festival	Pt. of the Mt., UT	Christopher Knowles, (402) 330-5335
July 22-23	SWIFT/Western XC	Mead, NE	
July 28-Aug. 6	NAIS - Soaring	Muncie, IN	Jim Thomas, (206) 488-2524
Aug. 12-13	Thermal Grabber**	Redmond, WA	George Joy, (619) 748-2167
Aug. 13	TPG Thermal Contest	Poway, CA	Jerry Caldwell, (210) 438-4077
Aug. 19	Handlaunch	San Antonio, TX	Scott Meader, (408) 244-2368
Aug. 19-20	SBSS Summer Classic	Gilroy, CA	Joseph Conrad, (206) 630-2670
Sept. 2	SASS HL 2	Redmond, WA	Art Markiewicz, (619) 753-3002
Sept. 9	TPG HLG Contest	Poway, CA	Gene Warner, (210) 732-3101
Sept. 16	2M/Open	San Antonio, TX	George Joy, (619) 748-2167
Sept. 17	TPG Thermal Contest	Poway, CA	
Oct. 7-8*	Fall Soaring Festival	Visalia, CA	Eric Larson, (619) 793-7640
Oct. 14	TPG Unltd. Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Oct. 15	TPG 60" Slope Race	Torrey Pines, CA	Bob Sowder, (901) 757-5536
Oct. 14-15	Fall Soaring Tournament	Memphis, TN	Greg Dickerson, (210) 656-1796
Oct. 21-22	Canyon Lake Classic	Canyon Lake, TX	Tom Meeks, (210) 590-3139
Oct. 21-22	2M, Open, HL - Potters Creek Park		George Joy, (619) 748-2167
Oct. 22	TPG Thermal Contest	Poway, CA	Art Markiewicz, (619) 753-3002
Nov. 4	TPG HLG Contest	Poway, CA	Eric Larson, (619) 793-7640
Nov. 11	TPG 60" Slope Race	Torrey Pines, CA	George Joy, (619) 748-2167
Nov. 12	TPG Thermal Contest	Poway, CA	Perry Van, (210) 658-8842
Nov. 19	Open	San Antonio, TX	Eric Larson, (619) 793-7640
Dec. 9	TPG 60" Slope Race	Torrey Pines, CA	George Joy, (619) 748-2167
Dec. 10	TPG Thermal Contest	Poway, CA	Buzz Waltz, (619) 327-1775
Dec. 9-10	Winter Soaring Festival	Indio, CA	
	World Soaring Jamboree		

* Western States Triad

**Unlimited, 2M

Los Banos Slope Scale Soar-In

SPONSORED BY

South Bay Soaring Society in cooperation with NASSA

MODERN ■ VINTAGE ■ POWER SLOPE SCALE

FUN-FLY

May 5, 6 & 7, 1995

- No Scale Documentation Required
- Winches will be Provided
- Aero Towing Available
- Awards for Best Sailplane and Best P.S.S.
- Nearby Hotels and Motels
- AMA Sanctioned

At Los Banos Reservoir, Los Banos, California

Event Director: Lynsel Miller (408) 275-6403

Assistant Director: Sean Sharif (408) 258-5074

\$15 Advance Registration Fee - \$25 on Site Registration

Outside U.S.A.

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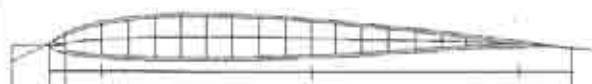
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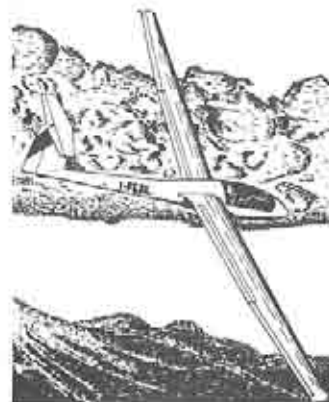
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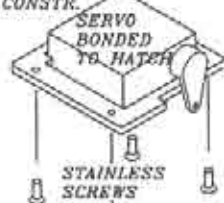
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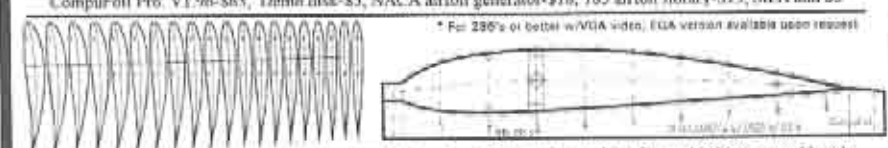
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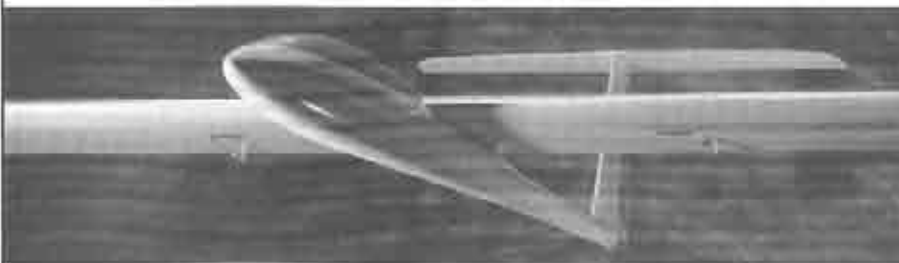
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N225 AE	1/3 A	.650	.642	.38	3.00
N250 AAA	AAA	.394	1.72	.35	3.00
N270 AAA	2/3 AAA	.551	1.16	.49	3.00
KR500 AE	2/3 A	.650	1.08	.63	3.00
N600 AA	AA	.543	1.94	.81	2.25
N-700 AAC	AA	.543	1.94	.81	3.00
KR800 AAE	AA	.543	1.94	.81	3.00
KR1300 SC	SUB C	.886	1.65	1.58	3.00
4 Cell Receiver Packs					\$12.00
5 Cell Receiver Packs					15.00

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GROUP B

	SIZE	DIA	HT	OZ	PRICE
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N800 AR	A	.650	1.90	1.16	4.50
N1000 SCR	2/3 SUBC	.866	1.29	1.44	4.50
KR1000 AE	1/5 A	.650	1.65	.95	4.50
KR1200 AE	A	.650	1.90	1.05	4.50
KR1400 AE	A	.650	1.90	1.09	5.00
N1400 SCR	SUBC	.866	1.85	1.87	4.50
KR1600 SCE	SURC	.866	1.85	1.65	4.50
KR2000 C	C	.882	1.82	2.71	4.50
4 Cell Receiver Packs					\$18.00
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GROUP C

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N1700 SCRC	SUBC	.866	1.65	1.90	7.50
KR2300 SCE	5/4 SUBC	.866	1.92	2.04	7.50
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4 Cell Receiver Packs					\$30.00
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GROUP D

	SIZE	DIA	HT	OZ	PRICE
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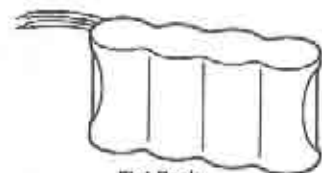
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 Fuselage Length 54 inches
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 Stabilizer Area 110 Sq. Inches
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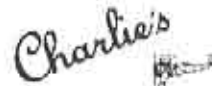
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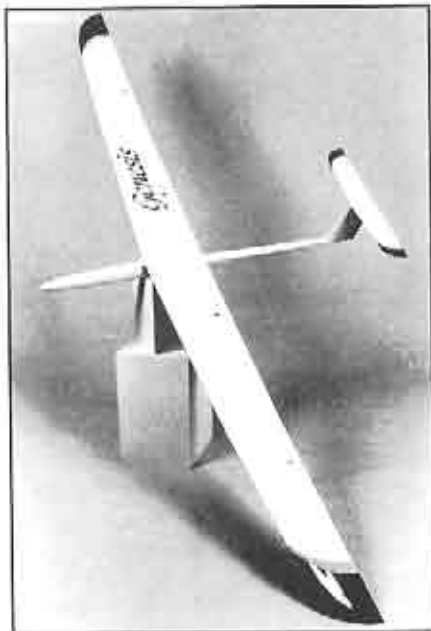
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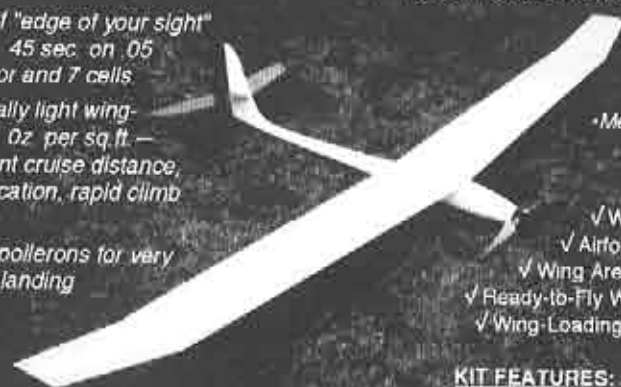
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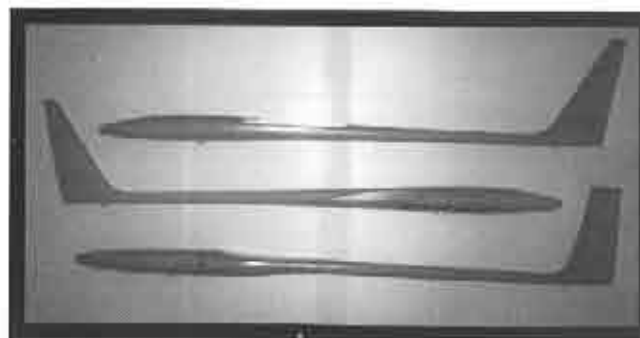
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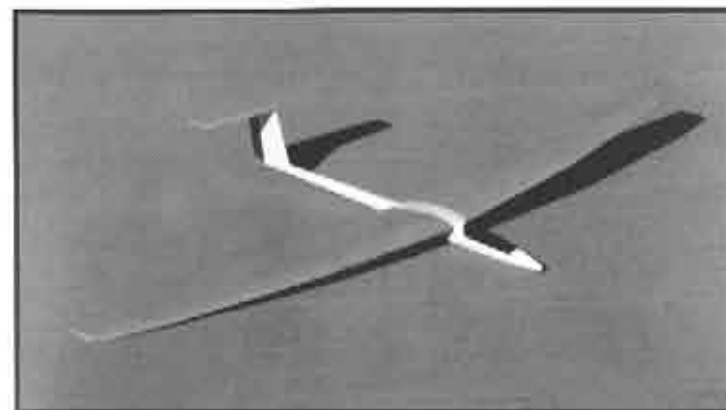
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