R/C Soaring Digest

June, 1995
Vol. 12, No. 6

U.S.A. $2.50

A SPECIAL AWARD!

George Ritter (L), a member of the Desert Union of Sailplane Thermalists (D.U.S.T.), is always there, always helping, and always involved. At the 1994 Festival, the members of D.U.S.T. showed George their appreciation by presenting him with a special award for excellence in support of the hobby, and their club. Rex Powell (R), D.U.S.T. co-founder & charter member, presented the award.

EMPIRE POLO CLUB'S FLIGHT PARK

The site of the December 1994 Winter Soaring Festival, and the upcoming 2nd Annual Winter Soaring Festival which will be held in December, 1995.
Photos courtesy of Buzz Waltz.
Story on page 10.

R/C SOARING DIGEST

A Publication
for the R/C Sailplane Enthusiast!

TABLE OF CONTENTS

OTHER SECTIONS/INFORMATION

ADVERTISING

SPECIAL INTEREST GROUPS & CONTACTS

Subscription Costs
USA: $30 First Class
(Texas res., please add $1.52 tax.)
Canada & Mexico: $30 Air
Europe/U.K.: $45 Air
Asia/Pacific/Middle East: $52 Air

Back Issue Cost
Back issues are available for 1993 and 1994, and are mailed via first class or airmail.
U.S.A., Canada, Mexico: $2.50 Per Issue + Tax (Texas Only: 7.25%)
United Kingdom/Europe: $3.75 Per Issue
Asia/Africa/Middle East: $4.35 Per Issue

❑ Please renew my current subscription.
❑ Please enter my new subscription to *RCSD*.
❑ Please send the back issues I have selected.

(Check or Money Order, only, please. U.S. funds.)

Name_____

Address_____

_____

_____

Please return to R/C Soaring Digest,
P.O. Box 2108, Wylie, TX 75098-2108

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

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

***RCSD* Staff**
Jerry Slates - Editor/Technical Editor
Judy Slates - Desktop Publisher, General Managing Editor, Subscriptions
Bob Sowder - Assistant Publisher

[Material may be submitted via 3.5" Disk (MAC or IBM compatible), and is most appreciated!]

Please address correspondence to:
Jerry & Judy Slates
R/C Soaring Digest
P.O. Box 2108
Wylie, TX 75098-2108 U.S.A.
(214) 442-3910, FAX (214) 442-5258

Feature Columnists
Gordon Jones, Bill & Bunny Kuhlman (B²), Fred Mallett, Kitty Pearson, Fred Rettig, Martin Simons, Jerry Slates, Ed Slegers, Scott Smith, Bob Sowder, Mike Deckman/Paul Ikona/Curt Nehring

Artwork
Gene Zika is the graphic artist who designs the unique Zika clip art.

Printing/Negatives
JACO-BRYANT Printers, Inc., Sam Lencke (901) 743-3466, Memphis, Tennessee

Seamless Graphics, Carl Loomis (901) 726-4113, Memphis, Tennessee

R/C Soaring Digest is printed on recycled paper.

The Soaring Site

Three Peas in a Pod

Yep, they're here, and their names are Mike Deckman, Paul Ikona, and Curt Nehring. They're from Southern California, and the soaring scene may never be quite the same. They plan on covering whatever strikes their fancy, or yours; their phone numbers and addresses are included with their column.

Wasatch Mountain

The folks in Salt Lake City, Utah are gearing up for the Wasatch Mountain Scale Soaring Festival which will be held on July 21 - 23 (+ July 24 is an extra fun fly day). There have been some changes made in event format, so if you are planning on attending, you might want to check out Tom Hoopes' article first; it appears in this issue.

We would also like to point out that there will be a **cross country event at a local full scale glider port** and, according to Tom, there will also be catered ribs with all the trimmings! Additionally, Tom Kikuchi of JR Radio has already generously donated two XF622 JR Radios (channels 31 & 50).

Folks such as Pete Bechtel and many of the other scale enthusiasts we know will be driving or flying in, and many of you have told us that you have been building models just for this event. Jerry, of course, will be there to join in the fun; he wouldn't miss it for almost anything in the world!

MSSC

And the folks in Huntsville, Alabama and Memphis, Tennessee are gearing up for the 4th Annual MSSC, which will be held on June 15 - 18 in Huntsville. While time is short, you can still join in the fun either as a spectator or flier. As of this writing, Ron Swinehart says that 15 states are already registered, with one person, Jim Thomas, coming from as far away as Washington state. There will be guest speakers this year, Ed Slegers and Jerry Slates; the vendor area has expanded over previous years, and a quick check of the Mid-South Official Program will give you some idea of the show discounts offered this year; if you don't have one, contact Ron at (205) 883-7831.

Happy Flying!
Jer & Judy

POINT OF THE MOUNTAIN

Wasatch Mountain Scale Soaring Festival

July 21 - 23

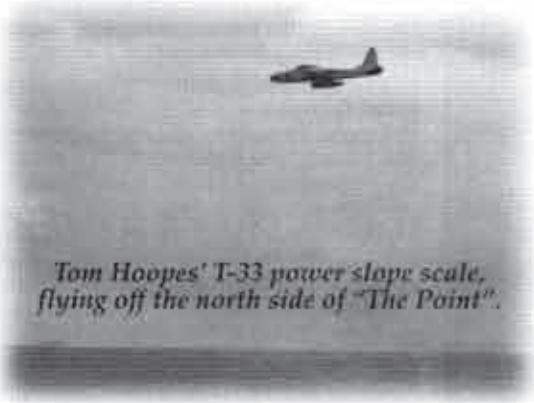
A Pretty Great State?

...by Tom Hoopes
Sandy, Utah

You bet! Forget that we have the world's greatest snow, forget that we are the capitol of software development, forget that we have the world's largest open pit copper mine, forget that we have the largest lake west of the Mississippi that is so salty that you'll bob like a cork, because we have slopes made in heaven!

Utah's scenic landscape includes the Salt Lake valley which is nestled between the Wasatch range to the east and the Oquirrh range to the west. Thanks to these mountains, winds are channeled north or south with few interruptions, except for a giant sandbar left behind from prehistoric Lake Bonneville called "The Point of the Mountain" that juts into the air flow.

In the morning, the winds usually blow from the south and often shift to a northern flow later in the day. The south side of the Point rises about 400' above the valley floor and levels off to a wide flat plain on top. The north side is quite different as it consists of two distinct ridges. The first ridge levels off at 300' with a bench that is several hundred feet wide, then rises an additional 700' on the "rear" hill. Both sides offer super views, good lift, and ample room to launch and land.



Tom Hoopes' T-33 power slope scale, flying off the north side of "The Point".

Launching west off the south side.

Allen Reese - View from south side of "The Point" in the spring.

Our club, the Intermountain Silent Flyers, often takes for granted the superb soaring conditions that exist in our own backyard, yet visitors are always impressed. Although it would be easy to keep to ourselves and allow other glider pilots to believe that Salt Lake City is 750 miles from civilization, instead we decided to share our little secret. On July 21 - 23 we are hosting the Wasatch Mountain Scale Soaring Festival. We wanted to put on an event that was fun and relaxing; therefore, we chose to minimize the emphasis on "Scale" (no scale documentation required) and capitalize on "Soaring". Friday (July 21) will be open fun flying for scale, PSS, or anything else you may wish to fly. On Saturday there will be a scale event that will consist of flying a fixed scale pattern with static judging taking place later in the evening. On Sunday, we will hold a cross country event at a local full scale glider port (20 minutes west of the Point) with facilities to support aero towing as well as winch launching. Open flying times will be interspersed among all of the events. For those wishing to stay past Sunday, the slope is open to flying and some of the local members are planning to fly at Francis Peak (10,000'+) on Monday July 24th, which is a state holiday.

We have already received a number of pre-paid entries among others, includes R/C magazine columnists and several big names in scale. Support from manufacturers and vendors includes: Windspiel Models (Pete Bechtel), JR Radio, *RCSD* (Jerry and Judy Slates), Viking Models U.S.A. (Jerry Slates), Slegers International (Ed Slegers), MRS Hobby, TLC Hobby, Sailplanes Unlimited, B^2 Streamlines, and others. This an AMA sanctioned event and we will require proof of current AMA membership.

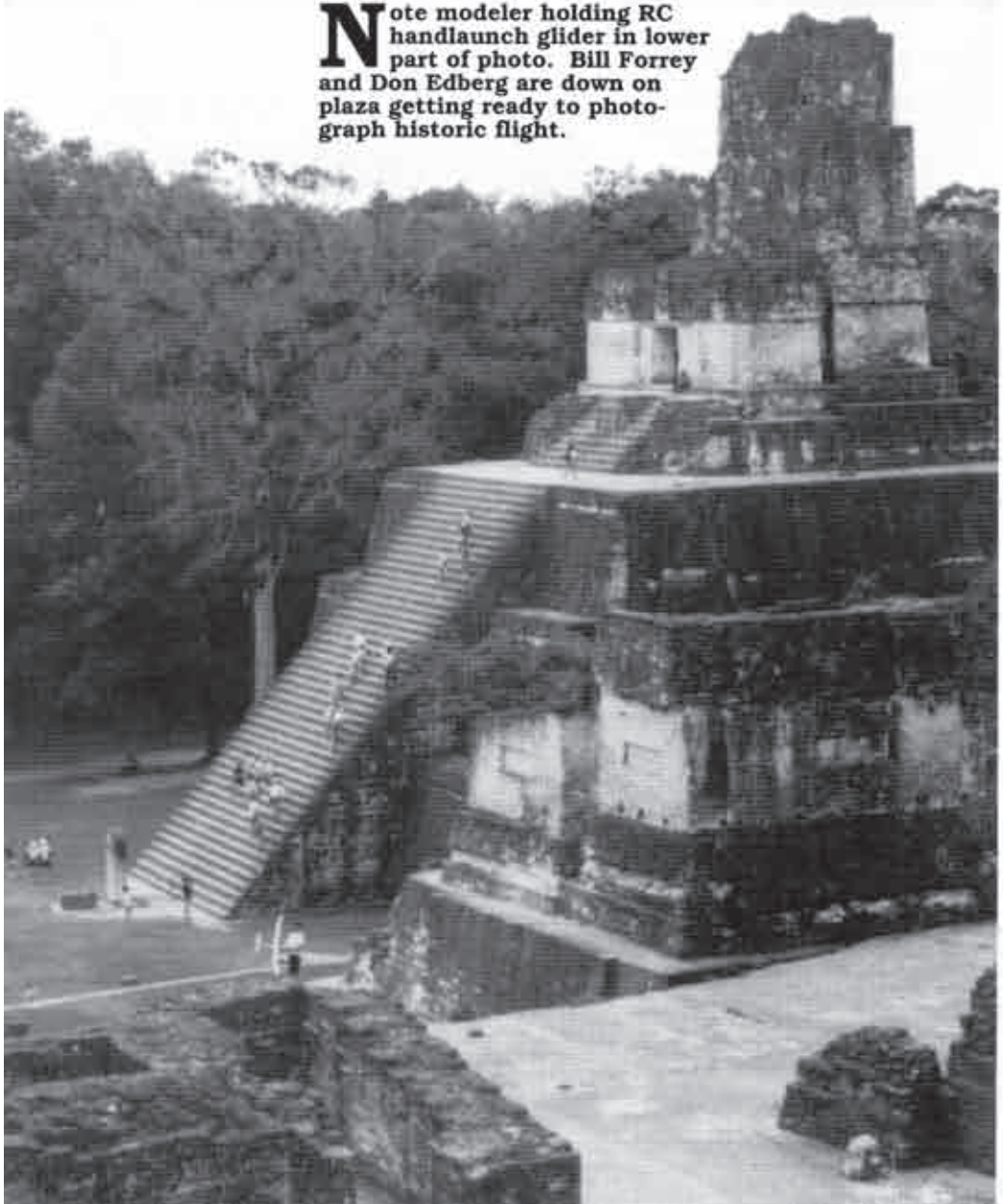
Please contact Bob Harman at (801) 571-6406 for a pilot's package, or Tom Hoopes (CD) at (801) 571-3702 for questions concerning the events. By the way, our local politicians thought long and hard to come up with that catchy (?) slogan: "Utah - A pretty great state". ...I guess other than our slopes, Utah is like any other state. ■

Mayan Soaring Match

...by Terry Edmonds
Solon, Iowa

MAYAN TEMPLE

Note modeler holding RC handlaunch glider in lower part of photo. Bill Forrey and Don Edberg are down on plaza getting ready to photograph historic flight.



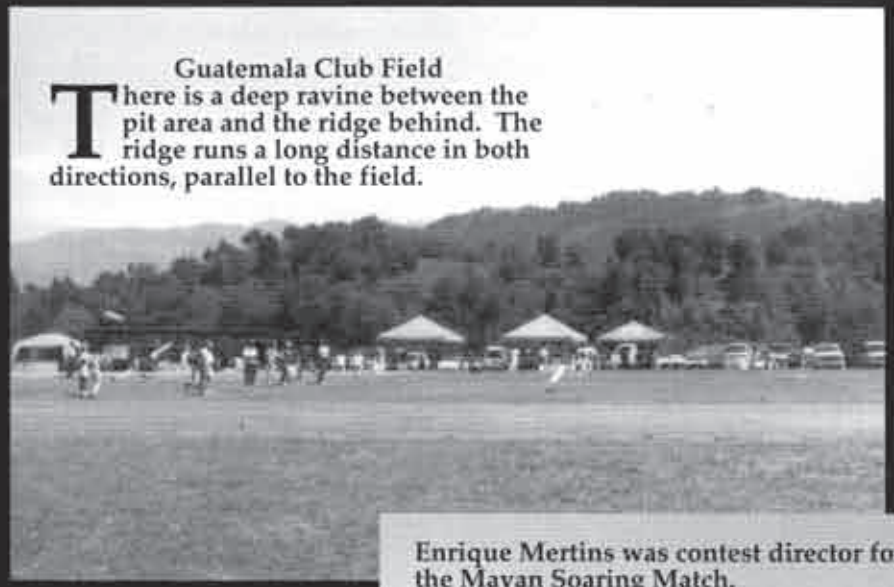
Indiana Jones (Mark Mills) launching RC glider off the top of Mayan Temple. Don Edberg piloting from below.

Are you looking for something different from the "same o" soaring contest? Well, there is something new and exotic on the scene that is definitely different. That is the Mayan Soaring Match held in Guatemala City, Guatemala. The event is hosted by a club there that has developed significant soaring interest. These folks have, in fact, participated in some well known USA contests over the last several years.

The Mayan Soaring Match has been held for a couple of years before, but this year the club made an effort to attract foreign participation. They accomplished this by convincing their airline sponsor "Aviateca" to offer extremely good deals on flights to Guatemala. They, in fact, attracted a number of well known USA competitors.

The contest was a three day affair with one day of practice and two days of competition. The task was a 3 for 15 minute duration, and a bulls eye type landing spot with three scoring levels. The site was on top of a mountain with deep ravines on two sides, and a mountain ridge on one side within flying distance. The terrain made for interesting soaring conditions. A perfectly, cone shaped volcano was in sight of the flying site, and added flavor to the event. The practice day was windy, about 25 mph, yet the lift was great. It seemed to be a combination of slope lift and thermal activity. The wind tapered to nearly calm at the end of the contest, and lift was good no matter what the wind speed was. A problem us foreigners had was reading the strange tropical birds. You would hear things like, "Do parrots thermal?"

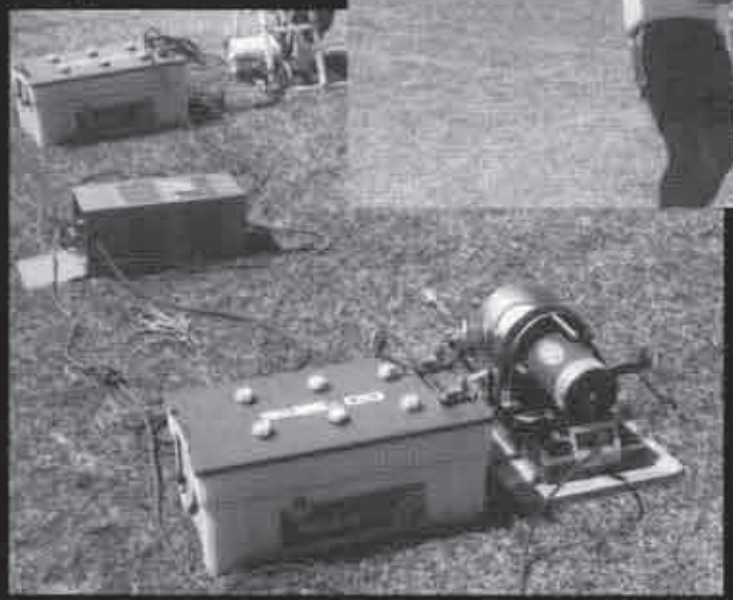
The folks down there have a little different concept on contest flying from us Northerners. They start flying about the usual time in the morning,



Guatemala Club Field
There is a deep ravine between the pit area and the ridge behind. The ridge runs a long distance in both directions, parallel to the field.

Enrique Mertins was contest director for the Mayan Soaring Match.

Winch batteries were home back-up solar storage batteries common in this part of the world. At the contest, they were continuously charged by a generator, which made for very snappy winches.



Mayan Soaring Match Competitors
Banner is for "Aviateca", sponsor of Guatemala club

Contest winners:
(L) Loren Mills, Utah (2nd)
(C) Ben Clerx, California (1st)
(R) Terry Edmonds, Iowa(3rd)

and keep the contest moving at a rapid pace for several rounds, and then stop early afternoon and party the rest of the day. This is a fun way to do it, but it's difficult for us hard core competitors to waste all that good afternoon lift.

The day after the contests, the hosts planned a trip to the ancient city of Tikal for everyone staying over. Tikal is actually on the other side of the country from the city, which involved flying some distance, and then another hour bus ride. Tikal is a fantastic place in a rain forest. It is a large city of Mayan ruins, including temples and pyramids several hundred feet high. It would take another article or likely a book to describe what we saw there. Of significance to R/C soarers was that Bill Forrey carried a hand launch R/C glider all the way on this journey so that we could fly it off the temples. The Mayan's probably didn't have this in mind when they built the temples, but then again, who knows. Maybe they were actually slope soarers. We were all amazed at this place, and had to leave all too soon.

Some of the most successful soaring contests offer a side attraction or entertainment aside from the contest, as was done here. This may be the trend of the future. The Guatemalans are already planning next year's event. You may think, "Why should I go that far for a contest?" Look at a map, and you will see that it is not that far away, and may not be further than some contests you go to within the USA. It is an adventure you will never forget! ■

Thanks, Terry! This is a perfect follow-up to Roger Lackey's article last month, and we're sure that some of the readers would, indeed, like to plan a vacation around this one.

Readers, Terry wants to "help the Guatemalans get the word out about their great contest". He can be reached at: Terry Edmonds, 4125 180th St. NE, Solon, IA 52333; (319) 644-2822. ■

Best of Show: Minimoa by Ron Gustin, Palm Desert, CA

(L - R) Gary Fogel, John Robinson, and Ron Gustin (winner Best of Show)

Scale Soaring Festival

December 10 &11, 1994

...by Buzz Waltz
President, Desert Union
of Sailplane Thermalists
3390 Paseo Barbara, CA 92262
(619) 327-1775

Well, the DUST has now settled and the I.M.S. Show is over with, so I can now get to the task at hand and write about the Scale Soaring Festival.

To say it was a success would be an understatement!

I feel that for the first time an event has been put together of this type here on the west coast, we did GREAT!

Saturday morning, December the 10th, we registered 25 pilots and several others flew who were not competing for the Scale Events.

By Saturday, noon, one of the club members gave me an airplane count, and we had 91 sailplanes and 1 tow plane sitting on the flight line. To name all the different ships that were there would take too long, but we were well represented by Minimoas, Granau Babys, Schweitzers, ASKs, DGs, and a 20 year old Duster that Don Edberg brought and flew.

I think that everyone agreed that the height of the show was the aerial towing, which was performed by Mr. Paul Nauck and his team from Rialto, California. They brought their own planes to tow, but also made towing available for those brave enough to try it.

As the day came to a close, we awarded the trophies for Best Scratch Built, Vintage Scale, Best Modern Scale, and the John Robinson perpetual trophy for best of the meet. This trophy was presented by Mr. Robinson, himself.

Sunday morning was crisp and cool. As the sun warmed things up, the lift began to improve. A number of our Saturday's flyers did not show up for Sunday's event, but those that remained had a great day of flying. Dennis Brandt, with his Thermo Flügel ASW 24, got the longest flight of the day, 15 minutes. It netted him not only a trophy, but $125.00 in cash. We are going to do this event again in December of this year, and the more entries, the larger the prize, as we took $5 from each of the paid entries in order to come up with the prize

Don Edberg with 20 year old Duster, and his new Diamant.

(L) Dr. Larry Fogelplacing with his Schweitzer TG3, (R) Buzz Waltz

Dennis Brandt (L) receives the cash for the longest flight from Buzz Waltz (R).

(R) Christopher Knowles came the furtherest, (L) Buzz Waltz

Mr. John Robinson is holding the Perpetual Trophy for First in Vintage. (L - R) Gary Fogel (Regional VP for Vintage Soaring Association), Rex Powell (D.U.S.T.), Buzz Waltz (CD, President of D.U.S.T.)

Sy Rahm of Rahm winch products came down to show his winch and retrieval system. We want more manufacturers like this in December.

(L) Greg Weatherford, winner Vintage Antique Class
(R) Buzz Waltz

amount.

We are already in the planning stages for the 2nd Annual Winter Soaring Festival. **It will be held on December 9th and 10th at the Empire Polo Club, Flight Park, in Indio, California.**

In addition to the two days of flying, we are planning to have a **Manufacturer Show**, which will be dedicated to only those that manufacture or support RC soaring. This includes: Thermal, Scale, Slope, and related products. We are also planning a **Mexican Fiesta type BBQ with entertainment** for Saturday evening.

■

List of Saturday's Winners

Best of Show:
Minimoa scratch built by Ron Gustin, Palm Desert, CA

Best Scratch Built:
1st Place, Sweitzer 126, Don Scharf, San Diego, CA
2nd Place, Granau Baby, Ron Gustin, Palm Desert, CA
3rd Place, Jantar 1, Jason Nemake, Phelan, CA

Vintage Antique:
1st Place, Minimoa, Greg Weatherford, Palm Desert, CA
2nd Place, Rhon Buzzard, Greg Weatherford, Palm Desert, CA
3rd Place, Schweitzer TG3, Larry Fogel, La Jolla, CA

Best Modern Scale:
ASW 24, Dennis Brandt, Anaheim, CA

Best Landing:
16 1/2 inches to centerline of runway. (This was done with the 20 year old Duster sailplane - Don Edberg's. The plane was the prototype that was built for Airtronics.)

Person Who Traveled the Longest Distance:
Christopher Knowles of Omaha, Nebraska
Chris was only going to stay one day, and then go see relatives in the Bay Area, but he said that he was having so much fun that he decided to stay for Sunday's flying, also. Chris was flying an Astro Flite ASW 17.

Special Award
It is only once in a great while that you have a member that goes beyond the normal for a club, and such is the case with George Ritter. George not only designed the winches and retrievals that we use, but he also put together a youth program in which we, D.U.S.T., hold over 30 national soaring records. He's always at the field to help any newcomer get his plane into the air. This is why D.U.S.T. awarded George with a lifetime membership to D.U.S.T. The award was a surprise!!

Note:
In 1995, all prizes will be awarded on Sunday, instead.

TRAINER CORD

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

Short Cord vs. Long Cord

My smiling instructor asked if I wanted to go flying. Hmmm, did I want to turn down this chance of having his undivided attention while standing in the sun on a beautiful overlook in Issaquah, Washington? Am I crazy? Of course, I wanted to go flying!

While I finished the dishes, he put the receiver into the plane I fly. So, what is wrong with being spoiled? When he finished he yelled, "Grab the trainer set and we are ready!" Grab the transmitters. Grab the transmitters. Holy dead batteries! I had just flown from California to Washington happily clutching my wings, excited about the chance to do some glider flying. Both transmitters were sitting lonely and dejected back in California.

Life is wonderful when the kids get old enough for "pay backs". Our not so young son owns a trainer set. Could he, in good conscience, deny his loving parents the use of his instructor transmitter and buddy box? Phil switched receivers, and we were on our way.

We usually use a Futaba trainer set which has a nine foot long trainer cord. It lays on the ground while I'm flying. When we're on the move, it must be looped over my arm.

How fortunate it was, I thought, that Jim's trainer cord was a mere six feet long. There would be no chance of entanglement.

We were happily flying slope lift, when the sun disappeared, the wind rose, and rain threatened. Turbulence bounded as the wind shifted. Phil toggled the switch on his transmitter, and sprinted across the slope face in hot pursuit. It didn't even slow him down to have me kiting at the end of that short cord. I spent the rest of the flying time with one eye tracking the swift gyrations of the plane, and the other watching for any signs of movement from my other half. It had been many moons since I had played "crack the whip", and I never relished being the whip.

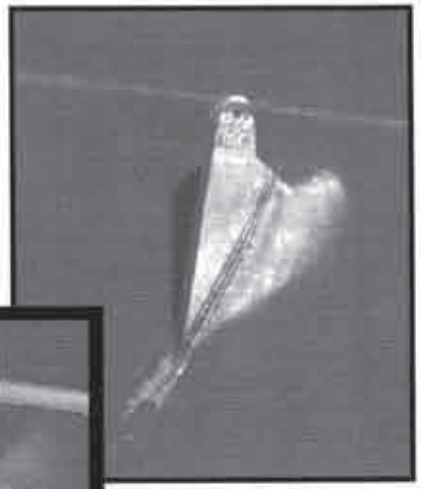
The moral of the story is that, "What you think you may want may not be what you truly need."

Long cord or short cord, trainer cords are wonderful. The instructor's transmitter is an honest to gosh transmitter. The buddy box just looks like the real McCoy. Only when the switch on the instructor's transmitter is toggled from master to slave does it allow signal input from the trainer stick. Conversely, flipping the toggle to master energizes the instructor's transmitter when the plane is in serious jeopardy of demise.

When spectators are especially keen, Phil will explain the controls, thrust the buddy box into their trembling hands, and toss the plane. It is a wonderful way to give the interested a feel for the joy of flying. Flying is stress free when intervention from disaster is a cord's length away. When the repair:flight time ratio is eliminated in favor of straight flight time, and when crash initiated guilt and remorse are eliminated, learning to fly is a piece of cake (and considerably cheaper). ■

Jer's Workbench

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



Installed flap control horn.

Installed aileron control horn.

Control Horns

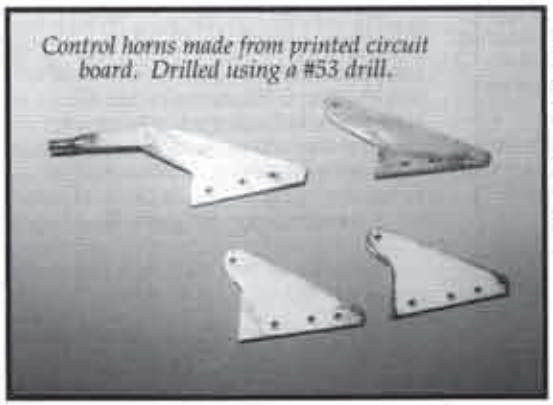
Living out here in Wylie, which is a very small town, there is no hobby shop, so I have to drive into Dallas if there is something I need. But the only problem is that all of the Dallas Hobby Shops cater to power type modelers. They have little or no glider kits or hardware items that fit my needs, so I have to mail order or improvise. Sometimes, when I mail order, I forget or don't order enough, so I have to improvise again. One of the items that I seem to forget when ordering is control horns.

Control horns are easy to make. I have found that purchasing a 5x7 inch Printed Circuit Board at Radio Shack, at a cost of about $5.00, that I can make a lot of control horns. Printed Circuit Board can be cut using a bandsaw or jigsaw, but if you don't have a bandsaw or jigsaw you can use a hand hacksaw and dress the rough edges with a file.

The photos show the two different control horns that I use. One set is for flaps and the other set is for ailerons. By making my own control horns, I can make them large or small, or whatever, to fit my needs, as one size does not fit all. After determining the size of the control horn required, I cut them out, dress the edges using a file, and drill some holes.

I found that the pin in a DU-Bro Kwik-Link to be .060 inches. If you use a 1/16th inch drill (.0625) you will be .0025 inches oversize and will have some slop in your controls. I use a #53 drill (.0595 inch). It's .0005 inch under size and makes a nice tight fit, with no slop. I also drill a few holes at the base of my control horns to insure that the glue holds the control horns when glued into the flaps and ailerons.

That's it, cheap and easy, if you don't have any ready made control horns. ■



Control horns made from printed circuit board. Drilled using a #53 drill.

LIFT OFF!

...with Ed Slegers
Route 15
Wharton, New Jersey 07885
(201) 366-0880 - FAX (201) 366-0549
9:30 AM - 5:00 PM (Closed Sun. & Mon.)

Speed 400

I believe one of the reasons that more people have not tried electric powered planes is the cost of the motor, planes, and the other necessary items needed to get started. It is not as expensive as you might think. With the ever increasing interest in smaller motors, it is now possible to try electrics for a small dollar outlay.

The most common and readily available motor is the Speed 400. This size motor has become so popular in Europe, that there are classes just for the 400 in competition. the nice part of the Speed 400 class is that the motor and plane can be very efficient in flight performance and still not cost much. For example, the motor costs $15.00 and most planes of the 60" handlaunch size, which would work well with this 400 motor, are also fairly inexpensive.

The speed 400 comes in three sizes. They are the 7.2, 6, and 4.8 volt models. They should be limited to about 10 amps. After that, they wear out very quickly. They are only 27.5mm in diameter, and 37.5mm long. They have a 2.3mm shaft and weigh about 72 grams. I have found that the 4.8 volt motor does not work well for a thermal duration type model, but that the other two worked well. Some of the best results were with a 7 x 5 prop. But more testing will tell. Also, the flux ring can be removed to get less amp draw, giving us more run time, but with a little less thrust. As I said, there is still some experimenting to do, but a 7.2 volt motor with a 7" prop will give you a very good starting point.

The batteries for the Speed 400 size motor are smaller and less expensive than the motor for the larger motor. 600 to 1000ma Sanyo's work best. I have used both and have found the 600ma batteries to be the best. Anything larger than the 600 is not worth carrying the extra weight for the extra run time. If you are looking for a pylon type model performance, you can go up a cell in each size motor and go down in prop size. This will make for a really fast model, but with little run time.

Another way to go, if you are looking for a better climb rate, is to use a gear box on your 400. This will let you swing a large prop at a lower rpm and lower amp draw. The combination I have used with some very good results is the Graupner 2.33:1, and a 10 x 7 prop.

Speed controllers, or on-off switches, are also available at a lower cost than the larger controller. Some units that work well are: Hitec on-off, Graupner Power Switch 20, Graupner Power Switch 25, Graupner Mini-Switch 40, Simprop S 90, Astro Flight Model 205, and Astro Flight Model 218, to name a few.

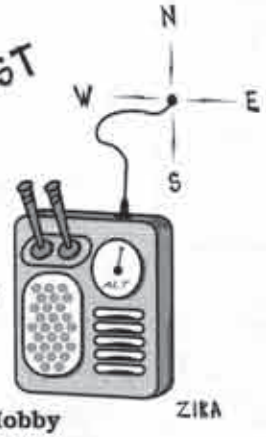
The charger is going to be the same as you would use for the larger setups, so you are not going to save much here. Make sure to get a peak detection charger with adjustable amps. A least you can also use this to charge your transmitter and receiver batteries.

If you should get any of the international magazines, you will see that they are full of 400 size planes. Certainly, too many to mention here. But most of them are about 60 - 70 inches in wing span. Most are rudder and elevator, and built-up wing construction to keep the weight down. Anything in this area would do for a start if it is light enough. An example is the Vertigo handlaunch that I converted to electric with a Speed 400 and wrote about a few months back in *RCSD*. The end result was a 60" plane, direct drive on 7 cells, and a weight that was under 20 oz.

If you are looking for an inexpensive way to try electrics, give the Speed 400 size a try.

Good Flying! ■

SOARING EAST TO WEST



with
Bob Sowder
1489 Wood Trail Circle
Cordova, Tennessee 38018
(901) 757-5536
FAX (901) 758-1842

Advancing The Hobby
March Issue Revisited

In the March issue I suggested that it may be time to re-vamp the AMA soaring rules by instituting skill level classes and de-emphasizing the length of wings as a class criteria. The reason for the March article was to give due consideration to the new and intermediate soaring enthusiast by exploring new ways for contest flying to become more palatable.

A contestant class rules structure will level the playing field and offer an opportunity for contestants to compete among their peers with similar skill levels.

I received several letters in response to the column, and here are some excerpts:

John Agnew
Fort Myers, Florida

"If competition is to grow or even continue, it is mandatory that we take an entirely new track... I agree with your suggestions. Scrap any reference to wing span, provide three skill levels, and let's go fly! You fly the kind of plane you like, and I'll fly what I like. We will need to watch carefully that people do not fly below their actual skill level — hardware hunters like that made me give up Pattern competition — otherwise nothing will be gained from the rule changes. I think we can handle that. I certainly would like to try it."

Jim Deck
Valparaiso, Indiana

"I read with interest your comments in the March, 1995 *RCSD* on "Advancing the Hobby". In general, I agree with many of your concepts. However, if you'll turn over a few pages to Pancho Morris' column which deals with "Intimidation", I think that you'll see the other factors which are working against the advance of the hobby.

"...Two factors are daunting: skill level and economics. Your ideas deal well with the former, but a look at the economics side is necessary as well. Just peruse the ads in *RCSD* and note the prices of "competitive" sailplanes these days. Maybe there is a sizable group that doesn't want to commit to $400+ sailplanes with 6 expensive mini-servos and a computer radio.

"...Unfortunately, this has led to disenchantment, and therefore lack of participation by many potential RC soaring enthusiasts. It has also depressed the market for relatively inexpensive built up sailplanes, thus putting up another barrier. I believe that both factors call for a [rules] overhaul or at least some adjustments in the organization of RC soaring competitions."

Ray Hayes
Washington, Michigan

"I read your March issue article and was touched with your interest concerning recruits to the hobby of model aviation. I have realized for a long time that my interest in promoting the sport is rare among model aviation enthusiasts. Most, and rightly so, are caught up in the learning curve or are simply enjoying the activity of building and flying and have little interest in becoming involved with organized club activities.

"...I am in my second year working with the local Parks and Recreation Department. They furnish me a beautiful field and description of the summer long schedule of flying activities in their quarterly publication that is mailed to every mail box in their jurisdiction. The highest number of

Tow plane up ahead. Mike Kelly steadies wing tip. Bob Sowder at controls.

Club Fun-Fly's are a great way to attract new people. MASS Soaring Club and Whitehaven Power Club getting set to aerotow TG-3.

FLYERS achieved at last years activities was 14 and most of them were brand new to RC flying.

"...If you want to attract new people to our hobby, do not emphasize contests. What needs to be emphasized is flying skills. As an individual's skills grow, he or she will likely ascend to ontest flying."

Summary

In terms of attracting new people to the sport, thus advancing the hobby, I have to agree with Ray Hayes's comments about not emphasizing contests to attract new people. I believe our local club has possibly lost some promising new members who were turned off by our formerly aggressive contest schedule.

Ray has founded a new soaring accomplishments program for 1.5 meter sailplanes called WINGS. Ray has told me in conversation that they have attracted a number of father-son teams looking for an activity to share. This is a great way to enter the sport of RC soaring. Perhaps in time, these

same people will find their way to a contest and enjoy flying with their peers in Novice Class.

There are still a number of modestly priced built-up kits on the market for those seeking to advance to competition. As a soaring community, we need to offer these people an entry point. Even with the abundance of today's high-tech ships, contests are won primarily by piloting skills, not sailplane design.

An analogy to sum up with is this: Starting out in this hobby is like catching a low level thermal. It starts out small... stay with it, and if you want, you can rise to the top.

Next month - "RC Soaring... Where it has been, and where it is going."

Thermals! ■

People in Soaring

Leon Kincaid

Webster, North Carolina

Leon's Modeling Resume

(This article was originally written by Leon for the Pelican Soaring Association newsletter, Pelican Droppings. It was submitted to RCSD by Kale Harden, and has been since updated by Leon. ED.)

From my earliest recollection at about 4 or 5 years old [I was born in 1926], I have been around aviation. At this age, my Dad was a navy radioman, stationed at Dahlgren Navel Air Station, Virginia. He flew in a twin-engine bi-plane, flying boat. I can remember the engines were suspended between the wings on struts and guide wires and the pilot and co-pilot sat in an open cockpit. From that period on, my goal was aviation.

When I was 9, I built my first shelf model. This is a solid balsa scale kit. Next was bunch of horrible flying stick rubber models. However, I did learn a lot. All kits were purchased at 5 and 10 cent stores. If there were hobby shops at that time, I didn't know about them. In 1939, when my Dad was stationed in Key West, now flying in PBY's, he bought me my first gas model, a Miss Tiny kit with a Phantom Bullet engine. I really wanted a Goldberg Comet Clipper, but it was a very high quality kit covered with silk. I must say, I did a pretty good job building it. It only flew fair, but that was my fault. It's difficult to learn about flying or trimming when there is no one to help you or no club to belong to. I built a couple more gas jobs, while living in Norfolk Virginia [near Norfolk NAS of course].

In the summer of 1942, there was an article in *Model Airplane News*, about modelers at NACA [National Advisory Committee for Aeronautics], building models for wind tunnels at Langley Field, Virginia, just across the bay. WOW, building models and getting paid for it! I figured I would get a summer-time job building models. Little did I know that it was a permanent civil service job. When they called me to go to work I was back in school. My Dad said I could go, but to finish high school, somehow. Well, it was several years before I finally finished H/S and many years later to complete College. Meantime, I was hired as an Aircraft Model Maker, but instead of being put in the model shop or a wind tunnel, I was put in the machine shop, which was really a good thing I later realized. Everyone I met, worked and lived with, was a model builder. In my shop was one of the best modelers I could meet and work with... Sal Taibi. We soon became room-mates and my modeling learning curve started to really climb. One day I was cutting out an aluminum rib template for my new design and Sal looked at it and said, "Holly mackerel, where did you get that airfoil?" I told him it looked like some that I had seen in the magazines. He said it was horrible and would be tricky to fly. He said, "Do it like this, draw a larger leading edge, make a long gradual undercamber like this, zzzip, now a nice elliptical upper camber, like this, zzzip, and there you have it." It looked so good, I used it, and I finally had my first competitive free flight.

In 1944 it looked like I might be drafted, so I joined the Navy. Six months later I was returned to NACA, but at Ames Aeronautical Laboratories at Moffett Field, California.

After the war, while still with NACA but as a civilian again, free flight was at a real low, so I raced model cars around northern and central California for a while. With my own designed car, and a Dooling .61 engine, I averaged 3rd world-wide in points and broke the world speed record at one time.

Back at NACA, we were now in the super-sonic age of research, and now I am REALLY building wind tunnel models, only usually out of solid steel. I fabricated several sets of wings with different airfoils, one neat delta wing, a model for boundary layer control research, and one copper model for heat-transfer research. The copper model, after being machined, was plated with .003" of hard chrome and then .0015" was ground off, leaving .0015" on to protect the sharp leading edge from getting dented due to the dust in this fast wind tunnel. As much as I loved this job, I joined the Air Force in '51. While stationed in Germany, my son became a teenager. There was a model contest coming up, so we both built hand launched gliders. Don was 1st and I was 2nd. I had the bug again. We then built a couple of F/F's. Next, I was transferred to Langley AFB... back where I started my career and back to my old model club, the Brainbusters. Now in the club are, John Worth, Bob Champine and Woody Blanchard. Here goes my learning curve up again. My present F/F design was called High-Ball, which was in all classes. 1/2A, A, B, C, and FAI. Frank Zaic was to have the FAI power plans in his next annual, but he stopped printing the annuals. Rats! I hit all the King Orange meets in Florida for the next 8 years. Just as I was going to my 3rd FAI finals, Uncle Sam says they needed me in Vietnam. Man did I luck out. I've been with bombers, fighters, you name it, but this was an assignment with a fantastic aircraft: the C-7A Caribou, the only wing of Caribou's in the Air Force. This is a STOL category aircraft. Even the ailerons were flaperons and came down during landing. There is much more I would like to say about this plane, but back to models.

After a 2nd tour to SEA, I retired in 1971 to Port Richey, Florida. What happened to all the free flight? Most contests were in Jacksonville, and no place to test fly. I decided to build an R/C [yukk] and joined the local power club. It was a Tampa club at that time. They flew on a landing strip near Tarpon Lake, then moved to Starky's pasture at the end of Gun Road. [It later changed to the West Pasco club.] I received no help. Now, I see pictures of R/C sailplanes in the mags. Not bad. No chasing and no engines. I didn't like the looks of the kits at that time, so I designed my own. First, I drew some rather radical designs, then said, "Leon, get smart. Design a simple trainer." I used my airfoil from my FAI power design and the basic planform of my Wakefield rubber design, only shorter. I called it, Chasco 72. It was 1972, had a wingspan of 72", and my daughter was 1972 Chasco Queen. After completion, I took it out to the power club flying field [during the week], set up my high start and test flew my first R/C. I was all over the sky. For the 2nd flight, I moved the CG where I thought it should have been, and away she went. One thermal after another. Flying was a cinch. It was the landings that were a challenge. I came home all excited, checked my AMA contest calendar, and found a sailplane meet at Mulberry in two weeks. I went. This was the first time I had ever seen another R/C sailplane, other than pictures in the mags. Well, I think I was last place, but boy did I learn a lot. That's where John Gunsaullus adopted me.

At my third contest, I was 3rd in duration, 3rd in precision [don't know how I did that], and 3rd overall. I then made a Chasco 99 using my old Wakefield airfoil. It was 4th at the 75 NATS. This was a good 4th. I was 1st in duration by a long way [10 min. maxes], but placed much lower in 2 min. precision, so I ended up 4th overall.

I then designed the Free Spirit with this same super floating airfoil. It was 1st at the 78 NATS. The standard size plans were in *Model Airplane News*, June, 79, and the 2M was in *Flying Models* in 81. It was 3rd in 79, 2nd and 4th [2M & standard] in 80, 2nd in 81, and in 82, I was 4th in Standard with the F/S, and 1st in 2 meter with my new 2M Scooter design. The 2M Scooter was in *Model*

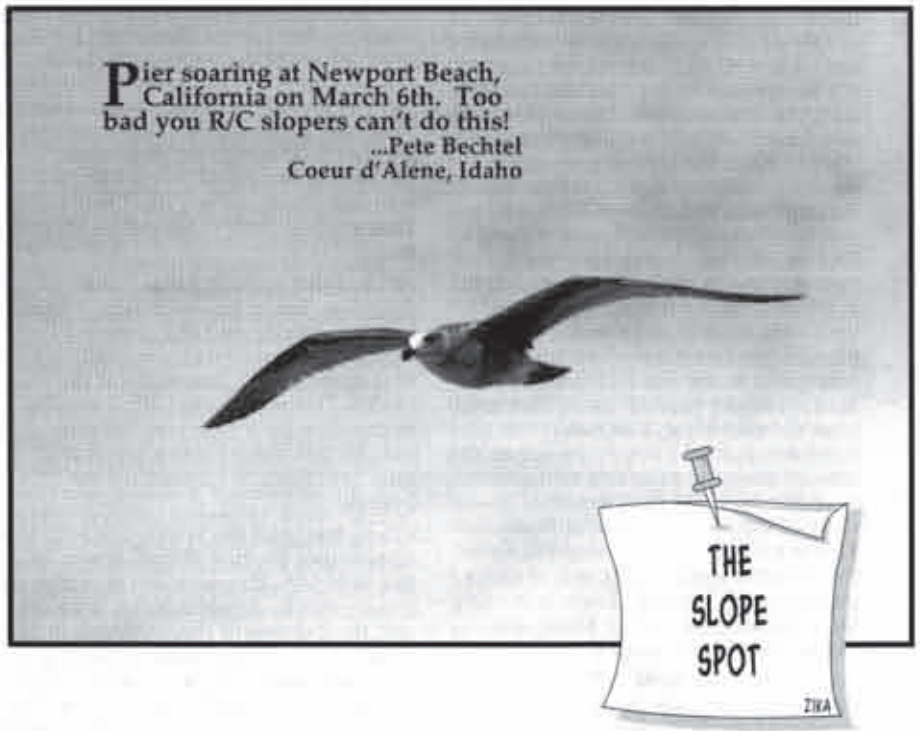
Aviation in 83. John G. was 1st in 83 with his 2M Scooter. I was 1st again in 86 NATS in unlimited with my 3M Scooter, and John again in 90 with his 3M Scoot. The 3M Scooter plans were in *MA* in 91.

So, I decided to up-date my planes and go for a fiberglass fuse, and designed the Heat Seeker. John was 1st in SMT at the LSF NATS in 92 with his new Heat Seeker, while I was 2nd with my Scoot. [I had sold him my H/S.] John was 1st again in SMT at the 93 LSF NATS with the H/S, and I was 3rd with mine. The Heat Seeker was published in *Model Aviation* in May, 1994.

So, what's next? Well, LSF now has a new Nostalgia event [pre-1980] and my Free Spirit should qualify, so I'm just completing a new one. After that, maybe a 2M Heat Seeker, or maybe I will design a simple back-to basics type of 2M. A simple KISS style sailplane. Something I can learn to land, as my learning curve is going down hill fast.

Signed by your roving Pelican,
Leon Kincaid

P.S. I don't have a tale like in Kale Harden's resume about a pig eating any of my aircraft..... However, there was this big police dog! While flying at Fentress NAS in Virginia, I had de-thermalized right next to a small communications shack. Normally there is a fence around these units, but here the Navy had a big, mean looking police dog on a long leash, so he could completely circle the shack. I had D/T'ed right on the edge of his circle. As I approached my model, he stretched his chain, rolled back his big lips, and with his big white teeth, grabbed a-hold of the right wing tip and started to pull my model into HIS circle. I quickly grabbed the left wing and pulled the other way. For some reason he let go, and we [me and my plane] were clear. He was not happy. I was. You know, there wasn't even a puncture or ding in my silk covered wing. ■



Fred Rettig
1408 Montlimar Dr.
Mobile, Alabama 36693
(205) 471-2507 (days)

California Soaring Products

I went back to California in April for the Masters of Soaring event. My, did I have a good time. The weather was just right; the evenings were cool and the days were warm to hot. Next month, I will give a run down on the contest.

While in California, I was able to visit with the guys at California Soaring Products. You know, I felt like a kid in a toy store. I mean, those guys have a large stock of kits on the shelves from F3B to low tech thermal kits, and also a few completed kits. Now, I know this sounds like an advertisement, and it is, but my main reason for making mention about California Soaring products is that they could well be one of the few stores dedicated to the soaring industry. As a connoisseur of fine thermaling, and a consumer of the equipment, I thought that they should be recognized for their fine efforts.

Now, I think that us fliers around the country need to support those guys of our hobby, because they have decided to venture out and try to be a service to us and to try to help make it profitable.

We all know that it is hard to do all of these things, especially the profitable part. Anyway, they carry a full service line of equipment and parts, and talking and visiting is their middle name. So, if you want to give them a call, the number is (818) 966-7215.

CASH - CASH - CASH

Attention: Any and everyone who dares!

Pensacola Air Modelers will be hosting their first contest with CASH PRIZES. This could be the start of something new for our sport.

Date: September 16 & 17, 1995
Location: Pensacola, Florida
(Site Eight, one square mile field)
Task: To be announced at a later date
Entree Fee: $35.00 for both days

Prizes:

First Place	$1000.00
Second	$500.00
Third	$250.00
Fourth	$150.00
Fifth	$100.00

(Also, possible travel money for first three places.)

Contact Fred (Cornfed) Rettig at (334) 660-1318 (home) or (334) 343-2300 (work). Make checks payable to Pensacola Air Modelers and send to:

Fred Rettig
2909 Petersburg Court
Mobile, AL 36693

Signing Off,
Cornfed

P.S. Say your prayers and drink more water!

ATTENTION: Bob Baker of Des Moines, Iowa. When thermaling real low to the ground, I have found that if you put a little circular motion in your hips, and hold the box over your head, it will make the plane climb out faster. Try it! ■

V-Tail Mixing with the JRX-347 and X-388 Computer Radios

...by Sherman Knight
Bellevue, Washington

Computer radios on the market today do a very good job of v-tail mixing. Complicating this issue is the fact that many of the radios have more than one method of programming v-tail mixing. Although more than one means may be available, it is important to select and use only one method to accomplish your objective. Otherwise, programming functions may be in conflict. The purpose of this article is to provide help in programming the JR radios for v-tail mixing. Nothing more than what is contained here is necessary for a polyhedral type aircraft. If you have a full function six servo airplane, then you prepare the v-tail first, then continue with the remaining programming. If followed, all the full blown programming functions link cleanly to the v-tail mixing. You need to realize that this is just one of many methods to accomplish this objective. If you disagree with my methods or have found one that is better, please let me know what they are for use in a future article.

This article also assumes that you own a JRX-347 or X-388, have the manual handy and are familiar with the six programming buttons across the face of the radio. The page numbers referenced in the article are the page numbers found in the manuals (A = X-347, B = X-388).

Both transmitters have two separate programming modes. These consist of the system setting mode and the function setting mode. Although the system setting mode comes at the end of the instruction manual, you must first set the system settings prior to the function settings. If you program the function settings first and then install the system settings second, it may result in wiping out your programming and returning to the system defaults.

SYSTEM SETTING MODE

You enter the system setting mode by pressing and holding the down buttons on the face of the transmitter, and then turning the transmitter on. Once in the system setting mode, you need to activate the v-tail mixing. (A = page 110, B = page 81), then touch the up and down button simultaneously to exit the system settings. Then press the UP or DN button until mix V-TL appears. Press the (+) or (-) key until the display reads ACT.

FUNCTION SETTING MODE

After turning the radio back on, touch the up and down button simultaneously to enter the function setting mode. You have now entered the section of the program that allows you to program and mix each servo in the airplane. The two tail servos are connected to the receiver as follows: elevator servo to left ruddervator, and the rudder servo to the right ruddervator (check to make sure that each servo is operating in the correct

direction. At this stage, the left rudder stick on your transmitter should move the right ruddervator and the right elevator stick on your transmitter should move the left ruddervator. Make sure they are both moving in the proper direction. If they are not, push the up or down button until you enter the function identified on the screen as "reverse SW" (A = page 87, B = page 89), then press the CH key until you find the servo you need to reverse. Once there, touch the (+) or (-) keys to reverse the servo.

PLACING BOTH RUDDER AND ELEVATOR CONTROLS ON THE RIGHT TRANSMITTER STICK

There are programmable mixing functions allowing you to mix any stick movement to any other servo on the model. These are mix A through D (X-347), or mix A through E (X-388). Mix-D's primary setting is master 2 to slave 4 (aileron to rudder). Mix-D differs from the others in that the mixing values for left and right are the same and no offset points can be set. Press the UP or DN keys until Mix-D appears on the screen (A = page 97, B = page 107). Press the CH button until Mix-D CH appears on the screen. Press the (+) key until 2 appears on the master channel setting. Press the (-) key until 4 appears on the slave channel setting (A = page 99, B = page 109).

Press the CH key until Mix D SW appears on the screen. For a full function aircraft, press the (+) or (-) key until the MX SW appears on the screen (A = page 99, B = page 109). This allows you to turn rudder mixing on and off with the switch in the rear right hand corner of the radio.

If you are flying a polyhedral airplane with no control surfaces on the wing, continue to press the (+) or (-) key until ON appears on the screen. Now, no matter what buttons you push or switches you flip during flight, your rudder and elevator controls will always be on the right-hand stick.

Continue to press the CH button until MIX D 2 4 appears on the screen. To the far right of the screen, there should be a zero followed by a percentage symbol. Standing behind the aircraft, press the aileron stick all the way to the stop. Nothing should happen. Holding the stick against the stop, press the (+) key. Both ruddervators should move. If the ruddervators move in the wrong direction, reset the value to zero by pressing the clear key and then pressing the (-) key until the ruddervators move in the appropriate direction. If you are flying a full function aircraft, this value will have to be modified over time to suit your taste. If you are simply installing mixing on a polyhedral aircraft, set the percentage mix to 100%. You should now have full v-tail mixing on the right-hand stick.

CONTROL THROW ADJUSTMENT

Review the instructions from your kit to determine the amount of control throw. Adjust the amount of throw by using the dual rate functions (A = page 85, B = page 86). Press the UP or DN key until the words dual-rate appear in the lower left hand corner of the screen. Press the CH key until ELE 1 100% appears on the screen. Move the elevator control stick until clear to the stop. Adjust for the proper amount of throw by touching the (+) or (-) buttons to match the elevator throw recommended in model instructions.

Perform the same function for the rudder. Press the CH key until RUD 1 100% appears on the screen. Move the aileron stick all the way to the stop, and press the (+) or (-) buttons until you have the right amount of rudder throw.

The instructions will only get you in the general area for your particular type, style and trim of your airplane. Use the dual rate function to modify the pitch or roll sensitivity of the aircraft to satisfy your personal taste. **I highly recommend, that once you have determined the optimum setting, that you program both switch positions with the same dual rate percentage.**

V-TAIL DIFFERENTIAL

To enhance the turning performance of your aircraft, you can now change the difference between the UP and DN deflection of the control surface on either side of the V-Tail. This is performed by changing the end point adjustments.

Up to this point, when adjusting elevator or rudder throws, both left and right ruddervators act in unison. End point adjustments now adjust the left and right ruddervators separately. For example, with a rudder turn only, the nose of your aircraft may pitch up. Now, by modifying the end point to increase the amount of down throw of each ruddervator, up pitch can be eliminated. Different from the control throw adjustments above, adjusting end points requires that you adjust the throw of both left (elevator servo) and right (rudder servo) ruddervators separately.

Touch the UP or DN key until T.ADJ appears in the lower part of the screen (A = page 89, B = page 91). Touch the CH key to identify the servo (rudder = right ruddervator, elevator = left ruddervator) whose end point you wish to adjust. Then, push the aileron stick all the way to the left or right and touch the (+) or (-) key until the control surface you wish to adjust moves the proper distance and direction. Each ruddervator has its own separate end points - UP or DN or (+) and (-). On the other half of the ruddervator, you must now adjust the other servo.

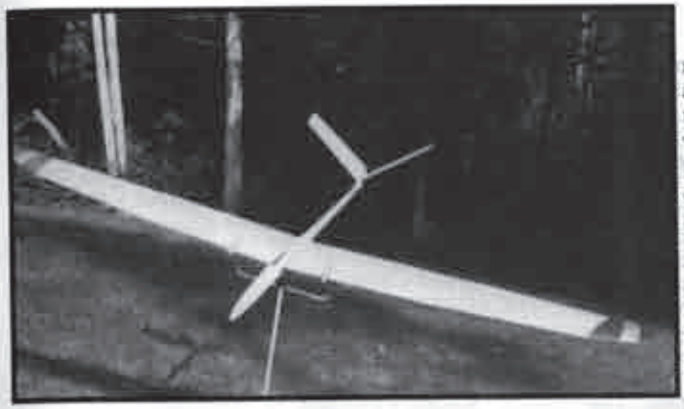
The need for v-tail differential is a byproduct of not understanding the exact decolege between the v-tail and the wing. Decolege is the difference in angle between the tail control surfaces and the wings. If you are lucky enough to get the decolege perfect, you probably won't need any v-tail differential. However, unless its perfect, rudder deflection will not only cause the aircraft to yaw or roll, it will also cause the aircraft to pitch up or down. The same effect may also occur if your servo or rudder control horns are not perfectly placed over center hinge line (creating a built-in mechanical differential).

To determine if your aircraft can benefit from differential, launch the aircraft and in slow level flight, level with the ground, move the left control stick (rudder only) on the transmitter. If the aircraft begins to yaw or roll, or if it pitches up or down, you may wish to experiment with modifying the end point adjustments to compensate for that pitching motion. If the airplane pitches up with rudder only input, then you need to increase the end point adjustments on both sides of the ruddervator to increase the amount of down movement of the control surface (in the alternative, try less up movement). The opposite is true if the aircraft pitches down.

If you are flying a polyhedral airplane, you are done. For a full six servo set-up, you need to perform the same type of flight testing to ensure that the v-tail is not inducing a pitching moment in the airplane with rudder only control. Other than that, all the remaining mixing functions of the radio are still available, including elevator compensation for flaps, elevator to flap mixing, and all of the butterfly mixes.

This radio provides an incredible flexibility for v-tail mixing. If any of you have any different means of programming for v-tail mixing on any of the JRX-347 or X-388, please let me know. Over time, I would like to assemble different ideas on programming these radios. Please give me a call at 206-455-2345, Pacific Standard Time, or send me a copy of your data sheet to 1000 Plaza Center, 10900 Northeast Eighth, Bellevue, Washington, 98004. These are great radios. I hope you found the information useful.

Good luck and good flying! ■



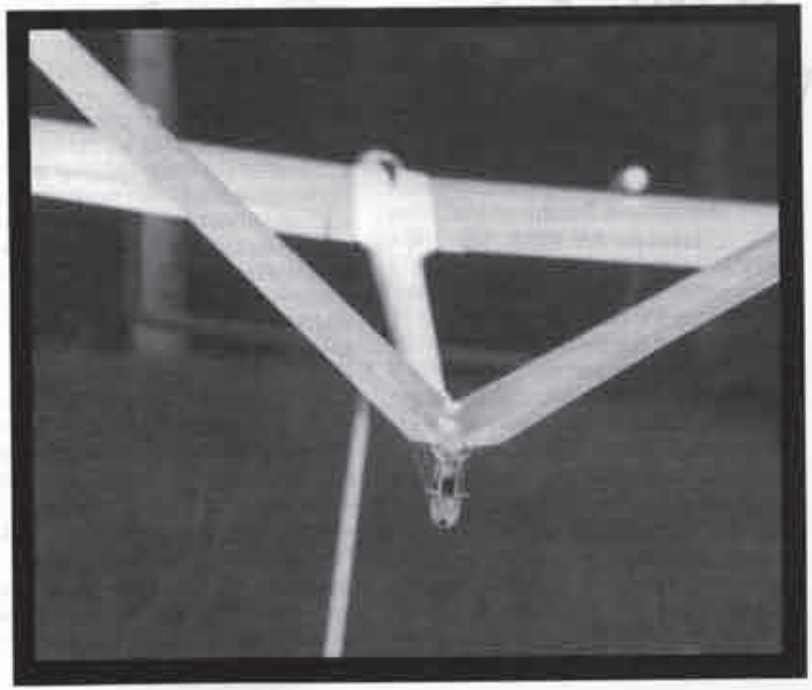
TO V OR NOT TO V
Converting to V-Tails

...by Art Boysen
Silverdale, Washington

One of my flying compadres converted his Legend to a V-tail. He eliminated a lot of nose weight, which bought the Legend into one nice flying machine. He told me that he bought the V-tail conversion kit from Fred Sage in California. Fred carries five V-tail conversion kits for hand launches all the way up to large (138" wingspan) size gliders. I decided to order one for my 2 meter Sagitta, and another one for my Jouster (120").

The V-tail conversion kit is complete consisting of V-tails, aluminum horns, fiberglass tape, a piece of balsa, and complete instructions. Pictures would have been nice, but are not really needed. The V-tails are vacuum bagged, Spyder foam, which are pre-hinged. Assembly consists of removing the existing fin from the glider and gluing the piece of balsa into the cavity where the fin was. The two halves are glued together at the established angle (106°). The bottom of this assembly is sanded flat for gluing to the fuselage, which is reinforced with fiberglass tape. The control horns are then glued to the ruddervators. Very simple.

Since I did not have time to convert the fore mentioned gliders (I need to build a Krause 1/3.75 scale ASW-27.), I decided to convert my Spectrum to a



V-tail. Instead of buying a kit from Fred Sage, I decided to make one out of foam and obechi from Dave's Wood Products. Pressing of the skins works out when you follow directions (*RCSD*, November '93). After the halves were glued together and sanded, I wrapped the joint with kevlar and fiberglass. I wanted to make the tails removable by using two 8-32 nylon bolts. The piece of balsa in the fuselage kept on splitting during landing, so I decided to glue the tails on permanently. Next time, I will use a piece of plywood in the fuselage for mounting. The braided control rods were replaced with solid wire pushrods obtained from Byron Blakeslee. Some nose weight was removed to balance the Spectrum at the proper location.

After a couple of days of flying, the Spectrum flies as good, if not better, than it did before. The major difference is that it is more sensitive to lift, now. When it flies through a thermal, the tail goes up like it is on an elevator. It is a matter of turning the glider into the thermal and riding it out.

If your glider needs a change, you might think about getting a V-tail conversion kit. It is simpler than you think. Now I see why the Super V is so popular. If I could only afford one...

Fred Sage
17232 Cuvee Court
Poway, CA 92064
(619) 485-6239

Byron Blakeslee
3134 Winnebago Drive
Sedalia, CO 80135
(303) 688-9572

Dave's Wood Products
Dave Acker
12306 Bergstrasse
Leavenworth, WA 98826
(509) 548-5201

Art Boysen
9809 Willamette Meridian Rd. NW
Silverdale, WA 98383
(360) 692-9965

■

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

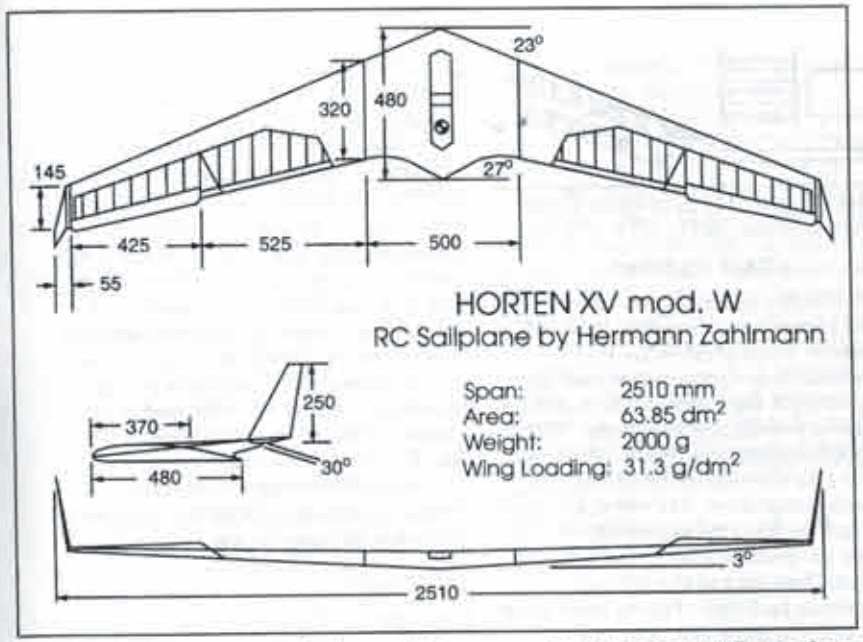
Hermann Zahlmann's Horten XV mod. W

Mr. Zahlmann's Horten XV mod. appeared in our January 1994 column. The Horten XV mod. W is a bit different, and we thought readers would appreciate seeing the various modifications which Mr. Zahlmann implemented in an effort to improve performance.

Mr. Zahlmann's major goals for the W version were identical to those of the original. The resulting sailplane was to be good looking, inexpensive to build, and easily transported. It of course had to be stable in flight, yet controllable, and capable of both thermal and slope flying. A simple radio installation was also a requirement. A performance improvement was expected to be derived from the use of winglets rather than the previous low aspect ratio fins.

On the Horten XV mod., low aspect ratio fins acted as wing fences and also served to separate the twisted and untwisted portions of the wing. This was of great benefit, as the twisted portion of the wing utilized an inverted section, and the mating of two such dissimilar surfaces would have otherwise caused quite a large amount of interference drag. The W version uses winglets rather than low aspect ratio fins, but retains the use of an inverted section over the twisted portion of the wing. The mating of the untwisted and twisted portions of the wing presented a challenge, as some type of transition had to be designed. Mr. Zahlmann's solution incorporates a trailing edge "ramp" which we will describe later and which is detailed in the included 3-view.

As usual, Mr. Zahlmann included a few interesting construction methods in the building of the Horten XV mod. W:



- The entire wing is built on a flat surface. This is easily accomplished due to the use of the Clark Y section across most of the span. The section is inverted over the entire twisted portion of the wing, and jig blocks are used to assure proper alignment. Three degrees of dihedral, as measured at the bottom of the wing, is incorporated during the final stages of the construction process.
- The transition from untwisted to twisted portions of the wing is accomplished by means of a "ramp" in the trailing edge. This "ramp" crosses one bay, and when viewed from the rear rises at a 30 degree angle. The trailing edge of the wing is flush with the building surface from the root to the end of the untwisted portion, and raised a constant 35mm over the twisted portion.
- The winglets are of relatively high aspect ratio and are angled outward ten degrees from the vertical plane. There is no toe-in; the winglets are aligned with the oncoming free stream flow.
- The W version, as the earlier model, has a cuspidate (bat) tail, but there is no reflex in the root section as used on the previous model.

The W version has a span of just over 2.5 meters, just slightly larger than the 2.4 meters of the previous, but the structure is essentially the same open wood frame and D-tube construction with fabric covering. The center section is large, and certainly capable of holding ballast when needed. Two servos are installed in the wing and drive the elevons directly. Flight characteristics are very similar to those exhibited by conventional tailed sailplanes. It has been flown repeatedly at the Wasserkuppe, in both strong and weak winds, with no problems. Thermal flying of the Horten XV mod. W is accomplished via a V-line and dual tow hooks.

The Horten XV mod. W demonstrates superior performance, has fulfilled all of Mr. Zahlmann's stated design goals, and offers an innovative wing junction which is worthy of study.

DELTA #2, Vereinsmagazin des FSV Versmold e.V. Reinhard H. Werner, editor. Halle/Westfallen Germany: FSV Versmold e.V., February 1986. ■

My Little Drilling Jig

...by Steve Savoie

Gorham, Maine

That was it, I wasn't going to drill another wing, stab or fuselage without building a drilling jig. In the past, I would put something together at the last minute with oak blocks and brass tubing, often built for one application and then discarded, or consumed through cannibalism for another needed tool. The first thing I had to decide on was a base. Plywood or Formica over particle board (counter top) just won't stand up in a New England basement (moisture and temperature). The only way to use these materials is with a strong back such as angle steel or aluminum. Too much work and expense.

So, I then went to the local home improvement warehouse and came across Melaine shelving material. It's smooth, cleans easy, can be drilled, and all six sides are sealed with a plastic type laminate coating, and the price was right. A few thread inserts (1/4 x 20) and matching countersunk screws were also purchased.

Seventeen aisles latter I came across the select hardwoods. Oaks splits, maple's too hard to work with, cherry just doesn't have a consistent grain, what about poplar? Poplar was selected because it has clear grain, is easy to work with, resists warping well, and was on sale.

The last item needed was some type of guide for the drill bits. Brass tubing is available in the right sizes, but it just didn't seam like the correct way to go. Then it hit me, I recalled seeing press in drill-jig guides in a woodworking catalog by the upstairs throne. These press in bushings have a splined outer surface and are hardened steel. The ones I used (2 per bit) were purchased from Woodworker's Supply. The price wasn't cheap, but have you ever had to put a price on an improperly drilled wing or stab?

The first thing to do was to lay out the jig sides and roughen up the Melaine surface for the epoxy. I then cut the front and back bushing supports and attach them to each other with double faced tape. These two pieces must be assembled, cut and drilled as one to retain parallel. The next decision was how high to drill the holes from the surface the wing would be set on. I decided on 1 1/2" since most wings on their bottom beds are well below this mark and the poplar was 1 x 3.

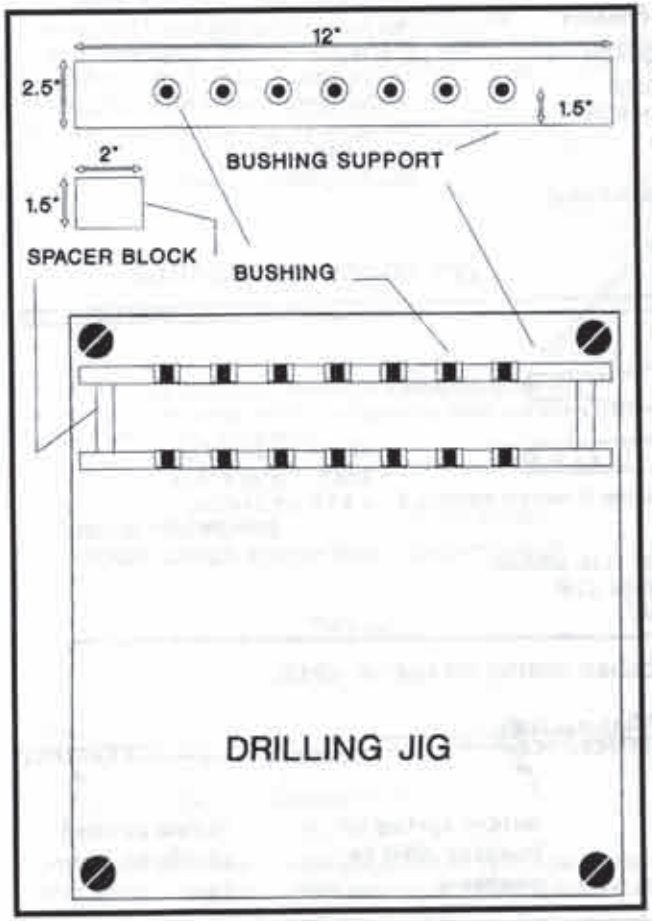
The holes for the guide bushing must be uniform and accurate, so I had to use a neighbor's drill press along with a set new Forstner bits. These are very accurate, thickly shanked, wood working bits designed for wood, only. A fence was clamped to the drill press table, and the 7 holes were carefully drilled through the two pieces of poplar that were still taped together. Not much tape is needed to secure these pieces to each other. The ends where then trimmed to size, and the two pieces were then separated; a bit too much tape was used, so an old putty knife had to be used to separate the two.

The next step was to press the bushings into the bushing supports; once again the old drill press was used to keep the bushings at a perfect 90°. The proper size drill bit was placed in the chuck, the bushing slid onto the bit, and a dab of epoxy was added on the splines for good measure. I then pressed them into the holes with the spindle drive of the drill press.

To assemble the jig, I inserted all my 12" bits into the bushings and gently separated the front and back bushing supports about 2" from each other. I then cut smaller spacing blocks (two taped together and cut as if one), which will be attached between the two bushing supports. The next operation was a little tricky and consumed almost every clamp in the old workshop. I marked the location of the spacing blocks on the bushing supports and mixed up 30 minute epoxy to attach every thing together. The drills were kept in the bushings; then the front and back bushing supports were epoxied to the spacer blocks. The entire assemble was positioned on wax paper over the Melaine shelf, and then clamped down to the shelf.

Make certain to check that the drills can still rotate in the bushings. If they don't, some minor adjustments may be needed before the epoxy sets. Once the epoxy had cured, I drilled and inserted 1 1/2", #6 wood screws from the bushing supports into the spacer blocks. Still with me? The end is near. Now, the entire assembly is clamped into position on the Melaine shelf to check for alignment. With 12" bits inserted full length, I had a droop of 1/64" at the end of the bits; not bad. This was corrected by shimming with .003" mylar along the bottom of the front bushing support. Now, the assembly was epoxied and clamped perpendicular to the center-line of the shelf board. Once the epoxy cured, screws were inserted from the bottom up into the jig from the shelf board.

To complete the installation, I clamped the finished jig to a true flat work bench and drilled 1/4" holes in the corners down through the bench. The holes in the bench were enlarged to accept the thread inserts, and the shelf board was countersunk to receive the four screws used to mount the entire assembly. I then purchased wheel collars for the bits, and use them to adjust for drill depth. Four holes were drilled in the spacer blocks to hold the attachment screws when not in use.



The bushing jigs I used were 1/8", 3/16", 1/4", 5/16", and 3/8". The bushing jigs are not available in the slightly larger sizes to drill holes to accept brass tubing, so I did the following. I cut a section of tubing and cut teeth into one end with a cut off wheel. Then, I slid the tube onto the drill bit extending the tip of the bit 1/4" past the tube; you can either tape or C.A. the other end to the bit. This will now oversize the hole to match the tubing outside diameter. Make sure to first drill the hole with the bit, only.

Some may consider this project overkill, but I don't get the jitters when drilling stabs or wings, anymore. The jig is also quite versatile;

My Little Drilling Jig

...by Steve Savoie
Gorham, Maine

That was it, I wasn't going to drill another wing, stab or fuselage without building a drilling jig. In the past, I would put something together at the last minute with oak blocks and brass tubing, often built for one application and then discarded, or consumed through cannibalism for another needed tool. The first thing I had to decide on was a base. Plywood or Formica over particle board (counter top) just won't stand up in a New England basement (moisture and temperature). The only way to use these materials is with a strong back such as angle steel or aluminum. Too much work and expense.

So, I then went to the local home improvement warehouse and came across Melaine shelving material. It's smooth, cleans easy, can be drilled, and all six sides are sealed with a plastic type laminate coating, and the price was right. A few thread inserts (1/4 x 20) and matching countersunk screws were also purchased.

Seventeen aisles latter I came across the select hardwoods. Oaks splits, maple's too hard to work with, cherry just doesn't have a consistent grain, what about poplar? Poplar was selected because it has clear grain, is easy to work with, resists warping well, and was on sale.

The last item needed was some type of guide for the drill bits. Brass tubing is available in the right sizes, but it just didn't seam like the correct way to go. Then it hit me, I recalled seeing press in drill-jig guides in a woodworking catalog by the upstairs throne. These press in bushings have a splined outer surface and are hardened steel. The ones I used (2 per bit) were purchased from Woodworker's Supply. The price wasn't cheap, but have you ever had to put a price on an improperly drilled wing or stab?

The first thing to do was to lay out the jig sides and roughen up the Melaine surface for the epoxy. I then cut the front and back bushing supports and attach them to each other with double faced tape. These two pieces must be assembled, cut and drilled as one to retain parallel. The next decision was how high to drill the holes from the surface the wing would be set on. I decided on 1 1/2" since most wings on their bottom beds are well below this mark and the poplar was 1 x 3.

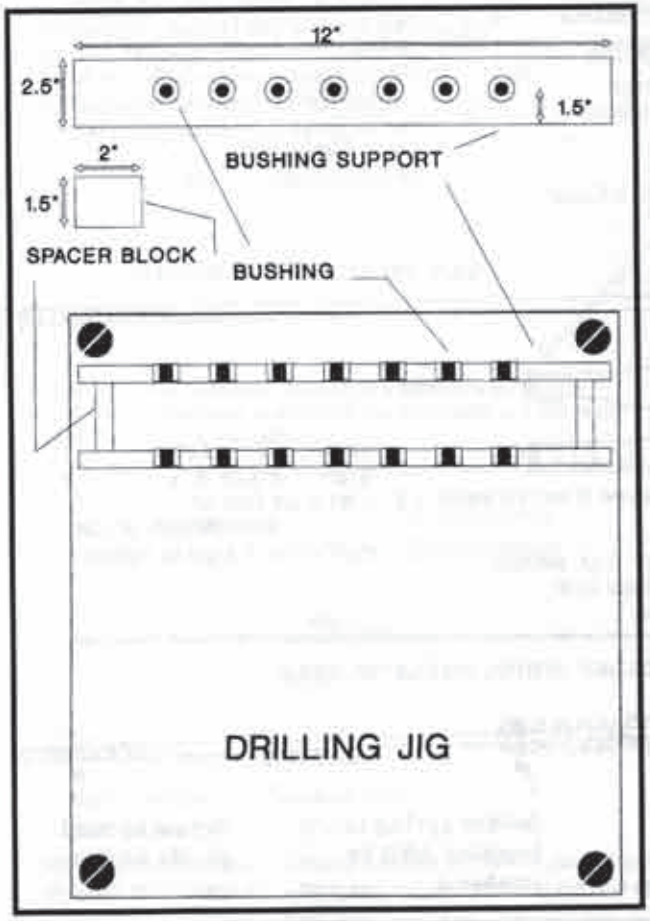
The holes for the guide bushing must be uniform and accurate, so I had to use a neighbor's drill press along with a set new Forstner bits. These are very accurate, thickly shanked, wood working bits designed for wood, only. A fence was clamped to the drill press table, and the 7 holes were carefully drilled through the two pieces of poplar that were still taped together. Not much tape is needed to secure these pieces to each other. The ends where then trimmed to size, and the two pieces were then separated; a bit too much tape was used, so an old putty knife had to be used to separate the two.

The next step was to press the bushings into the bushing supports; once again the old drill press was used to keep the bushings at a perfect 90°. The proper size drill bit was placed in the chuck, the bushing slid onto the bit, and a dab of epoxy was added on the splines for good measure. I then pressed them into the holes with the spindle drive of the drill press.

To assemble the jig, I inserted all my 12" bits into the bushings and gently separated the front and back bushing supports about 2" from each other. I then cut smaller spacing blocks (two taped together and cut as if one), which will be attached between the two bushing supports. The next operation was a little tricky and consumed almost every clamp in the old workshop. I marked the location of the spacing blocks on the bushing supports and mixed up 30 minute epoxy to attach every thing together. The drills were kept in the bushings; then the front and back bushing supports were epoxied to the spacer blocks. The entire assemble was positioned on wax paper over the Melaine shelf, and then clamped down to the shelf.

Make certain to check that the drills can still rotate in the bushings. If they don't, some minor adjustments may be needed before the epoxy sets. Once the epoxy had cured, I drilled and inserted 1 1/2", #6 wood screws from the bushing supports into the spacer blocks. Still with me? The end is near. Now, the entire assembly is clamped into position on the Melaine shelf to check for alignment. With 12" bits inserted full length, I had a droop of 1/64" at the end of the bits; not bad. This was corrected by shimming with .003" mylar along the bottom of the front bushing support. Now, the assembly was epoxied and clamped perpendicular to the center-line of the shelf board. Once the epoxy cured, screws were inserted from the bottom up into the jig from the shelf board.

To complete the installation, I clamped the finished jig to a true flat work bench and drilled 1/4" holes in the corners down through the bench. The holes in the bench were enlarged to accept the thread inserts, and the shelf board was countersunk to receive the four screws used to mount the entire assembly. I then purchased wheel collars for the bits, and use them to adjust for drill depth. Four holes were drilled in the spacer blocks to hold the attachment screws when not in use.



The bushing jigs I used were 1/8", 3/16", 1/4", 5/16", and 3/8". The bushing jigs are not available in the slightly larger sizes to drill holes to accept brass tubing, so I did the following. I cut a section of tubing and cut teeth into one end with a cut off wheel. Then, I slid the tube onto the drill bit extending the tip of the bit 1/4" past the tube; you can either tape or C.A. the other end to the bit. This will now oversize the hole to match the tubing outside diameter. Make sure to first drill the hole with the bit, only.

Some may consider this project overkill, but I don't get the jitters when drilling stabs or wings, anymore. The jig is also quite versatile;

the 3/16" bushing guides can be used to center that red hot poker used to melt out wiring channels. To drill a wing or stab, just keep it on the bottom bed, and just shim it up from the bottom with sheet stock balsa or ply.

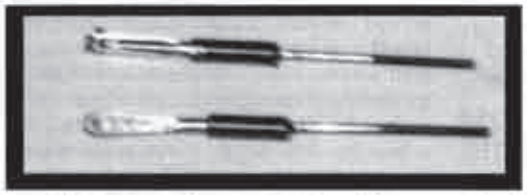
Try it, you'll like it.

Materials

12"X36" Melaine Shelf	$6.49
1"x3"x36" Poplar	$4.69
Drill Bushings (10)	$31.00
Misc. epoxy, screws, etc.	$2.00

Woodworker's Supply
1-800-645-9292
4 Locations: Seabrook, NH - Graham, NC - Gasper, WY - Albuquerque, NM

■



Wargo Super Simple Servo Saver (WSSSS)

Designed by Bob Wargo
Pelican Soaring Association
AMA 9298
L.S.F. IV

Original idea from Walt Good

(The WSSSS was mentioned on page 9 in the May issue of RCSD. Kale Harden of Palm Harbor, Florida sent in this detailed information and says, "It is a servo saver which is to be used on flap servos and which reduces the incidence of gear stripping when one lands with flaps down. [Inadvertantly, of course!])

Parts:

1. **Push Rod** — **CUT TO SUITABLE LENGTH**

2. **Clevis (2 ea.)**

BRASS

3. **Spring**

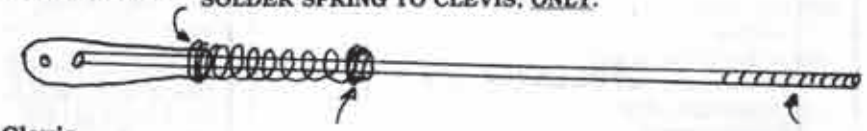
ABOUT 1 1/4" LONG
3/32" OR 1/8" I.D.
 # 81X AT LOCAL HARDWARE STORE

(One spring makes 2 servo savers.)

4. **Bushing**

3/32" O.D. BRASS TUBING 1/8" LONG
CUT INTO 2 EQUAL PIECES

Construction: **SOLDER SPRING TO CLEVIS, ONLY.**



Clevis
Drill so that push rod slides easily in and out.

Solder spring to bushing AND to pushrod.

Screw second clevis on here.

Understanding Sailplanes

...by Martin Simons

13 Loch Street, Stepney,
South Australia 5069

Flight Without Figuring Part 4
Downwash

The current approaching a weir or waterfall in a river, begins to speed up before it reaches the fall. If there is a bridge or boulder in a stream, the water will begin to feel its approach before it gets there. Once past the obstruction, the flow does not return instantly to normal, but readjusts over some distance. It is characteristic of all moving fluids that any change has effects on the current both upstream and downstream.

Air at speeds less than that of sound, behaves like any other fluid. Slightly

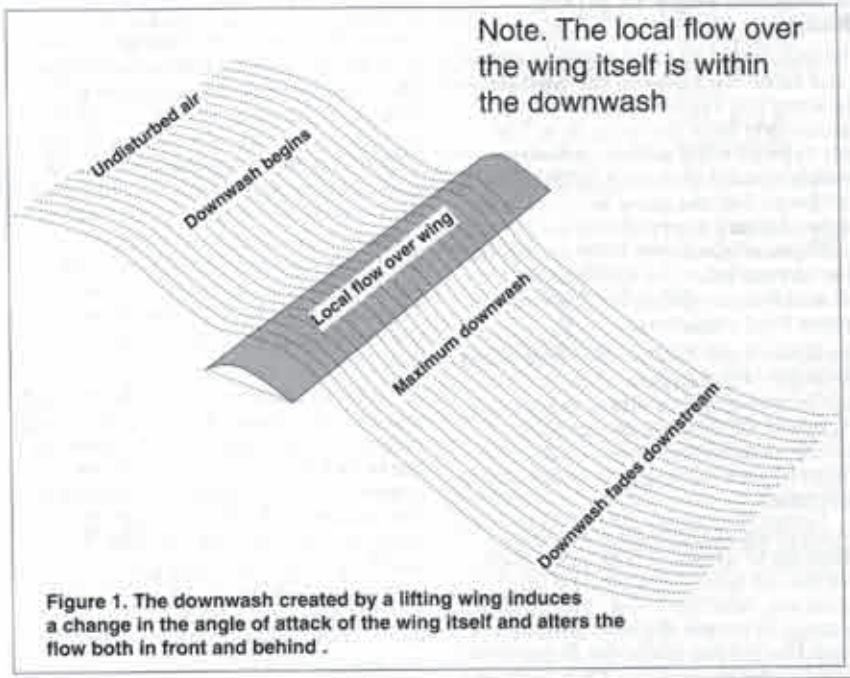


Figure 1. The downwash created by a lifting wing induces a change in the angle of attack of the wing itself and alters the flow both in front and behind .

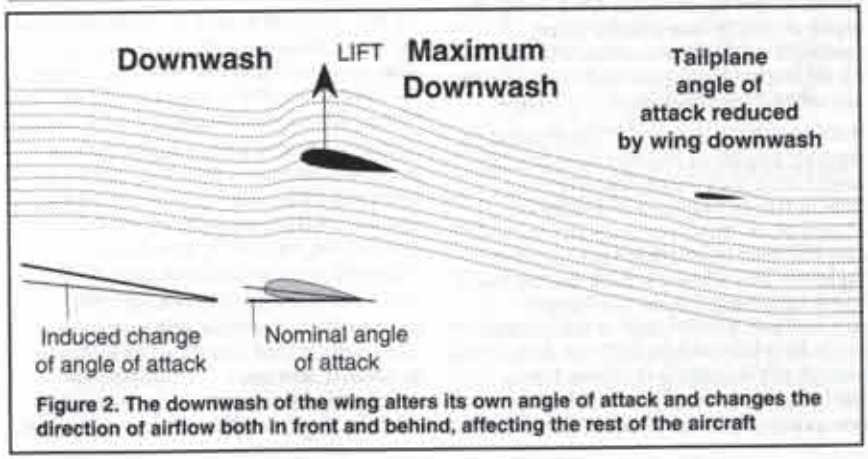


Figure 2. The downwash of the wing alters its own angle of attack and changes the direction of airflow both in front and behind, affecting the rest of the aircraft

ahead of a lifting wing, the airflow begins change direction and speed. After the wing has passed, recovery takes place over some distance behind it.

In order to produce lift to carry the weight of an aircraft, the wing must apply a downward force to the air. There is a down turning of the flow, or downwash, **both in front and behind** (Figure 1). This causes a reduction of the angle of attack, called the **induced angle of attack change**.

The induced change of angle of attack is not often the same all the way across the wing but varies across the span, particularly near the wing tips. The only type of wing which, in theory, creates equal downwash from tip to tip and hence has the same aerodynamic angle of attack everywhere, is one with an elliptical planform. Even in this case interference from the fuselage, or the tail surfaces, modifies the flow and causes local variations.

The downwash behind the wing alters the angle of the airflow at the tail so that its true angle of attack is reduced (Figure 2). In the case of a canard aircraft, downwash ahead of the main wing reduces the angle of attack at the foreplane.

If a tailplane is carrying any load, either up or down, it creates its own downwash which distorts the flow upstream, near the wing, and modifies its angle of attack slightly. Similarly, a canard foreplane alters the downwash ahead of the mainplane. One wing of a biplane or triplane combination, operates within the downwash created by all the other planes and they in turn are within its downwash influence.

It follows that whatever the geometric rigging angles of mainplanes, tail or foreplanes may be on the drawing board, the aerodynamic angles of attack of all these surfaces interact with one another in a rather complicated fashion. The wings, which do the main work of lifting, create the largest downwash. Every part of the aircraft, including the wing itself, has to operate within the resulting distorted flow. At the same time each smaller lifting component causes its own distortions spreading in front, behind, and sideways.

The angle at which the air finally arrives at the leading edge of a wing or tail surface is thus altered by everything else in the neighbourhood. Fortunately, all these influences are systematic and, by a combination of experience and calculation, can be allowed for.

The pitching moment

If a wing is perfectly symmetrical in section, it will be at aerodynamic zero when its chord line is exactly in line with the airflow. The flow has to pass above and below. The distance to be followed is greater than it would be if no wing were present. Hence the speed of flow **on both sides** increases at first, then decreases as the trailing edge draws nearer (Figure 3). The pressure on both sides of the wing obeys Bernoulli's principle. Pressure falls equally on both sides of the wing. There is no lift because the change is the same on both surfaces and cancels out.

If such a symmetrical wing is brought to a positive angle of attack, there will be a pressure difference. The flow on the upper side will have a longer journey and will speed up more than that underneath. The symmetrical wing is thus perfectly capable of yielding lift. At small angles of attack both sides will feel reduced pressure. The lift appears because of the difference. There is low pressure below the wing but lower still above.

As the angle of attack of the symmetrical wing increases, its lifting ability also increases just like any other wing but like any other wing, it will eventually reach its stalling angle.

Reducing the angle of attack below zero, will produce negative lift. Symmetrical wing sections are commonly used for stabilising surfaces (tailplanes, fins etc.), which are required to provide lifting force as easily in one direction as the other.

On aerobatic models, it is useful to have wings that can fly upside down as readily as right way up, so symmetrical profiles are often used. The stalling angles will be the same in both

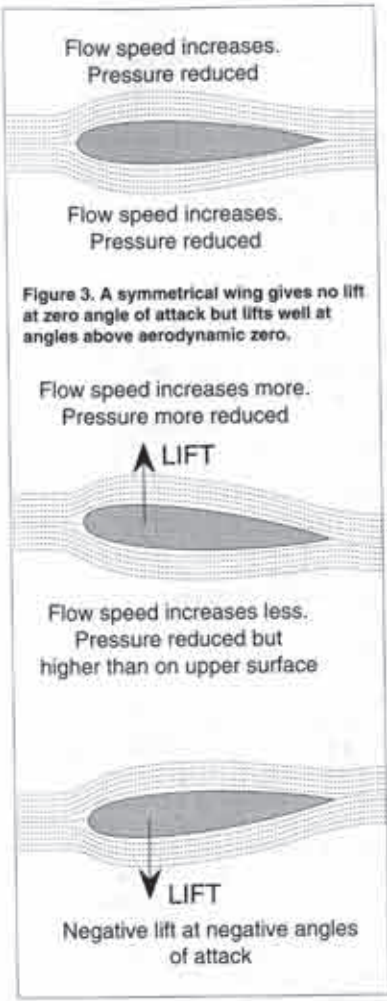


Figure 3. A symmetrical wing gives no lift at zero angle of attack but lifts well at angles above aerodynamic zero.

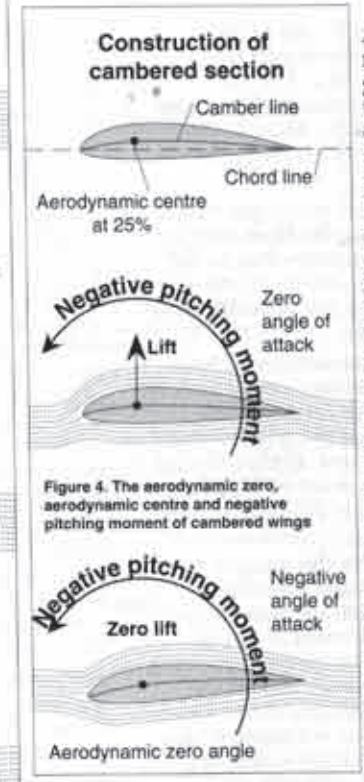


Figure 4. The aerodynamic zero, aerodynamic centre and negative pitching moment of cambered wings

positive and negative directions. (I.e., right way up and inverted.)

Most wing sections are cambered. They are constructed around a curved centre line. The distance that this curved centre or mean line is from the chord line at each point, describes the amount and type of camber. (Figure 4. This will be looked at again later.) The geometric chord is used for reference as usual.

When the chord line of a cambered section is at zero angle to the airflow, this is not the aerodynamic zero. The camber forces the air on the upper side to flow faster than that below. A pressure difference arises and the wing produces lift even though it is nominally at zero geometric angle of attack. At some negative geometric angle, the lift will disappear and the aerodynamic zero angle will be found. At this angle of attack, the average speed of flow above and below the wing is the same, so there is no pressure difference in total.

Pitching moments

All positively cambered wings tend to pitch nose down. (The stabiliser has to oppose this in flight with a nose up force. This is why most tailplanes carry a download.) Because of the camber the changes of pressure above and below are not in balance along the chord of the wing. An aerodynamic couple or **pitching moment** arises which tends to turn or twist the wing to a negative angle of attack.

The pitching moment does not disappear at aerodynamic zero. If a cambered wing is allowed to have its own way, it will pitch nose down, to aerodynamic zero, at which time the aircraft will be diving vertically. The pitching moment, still present, will force the wing into a bunt to the inverted position. This is the basic cause of 'tuck under', which can cause some models to go out of control and crash.

Remember that all aerodynamic forces increase very rapidly as the airspeed rises. The square law applies. Twice the airspeed means four times the air loads. In a steep dive the pitching forces on a cambered wing are very great because the speed is high. Wings will often twist and break in such

situations. Since it is part of the stabiliser's job to counteract the pitching moment, in a dive the stabiliser has to produce a large nose up force. If not strong enough, the stabiliser may break off in the downward direction.

The centre of action of the pitching moment, providing the flow does not separate, is always very close to the quarter point of the mean chord of the wing. This is called the **aerodynamic centre** of the wing.

(The mean chord is mentioned here, because if the wing has sweep back or sweep forward, the aerodynamic centre will not be at the quarter chord point of the wing root. the location of the average chord must be found, and the a.c. will be at the 25% position of this.)

The more cambered the wing is, the greater the nose down pitching moment. A symmetrical wing section has no pitching moment at lifting angles of attack. This reduces twisting loads on the wing and relieves the stabiliser of its balancing force. This is another good reason for using symmetrical sections for the wings of high speed aircraft and aerobatic models.

Aerodynamic centre and centre of pressure

In the early days of flying, when engineers measured the forces on cambered wings they usually interpreted the pitching moment as the result of a moving centre of pressure. It was supposed that the lift acted at some point which changed position as the angle of attack varied. Calculations were performed to track the movements of this imagined centre of lift.

At high angles of attack, near stalling, the c.p. seemed to lie well forward on the wing, usually at less than a third of the chord behind the leading edge (Figure 5). As the angle of attack was reduced, the calculated centre of pressure moved back progressively. At lower and lower angles of attack, the c.p. seemed to move behind the wing entirely, beyond the trailing edge and further aft still. With an aircraft flying at high speed and low angles of attack, or in a dive, the centre of pressure of the wing could be far behind the tail.

This seemed rather odd, since the lift force on which the entire calculation was based, was still felt and measured at the wing itself, not behind it.

At the aerodynamic zero (no lift) the calculations indicated the centre of pressure to be at an infinite distance behind the wing.

Despite these rather strange results, the mathematical results were incontestable. For calculations of balance and stability, it was quite satisfactory to work with the idea of a moving centre of pressure. Many excellent aeroplanes were designed in this manner. The method remains valid, although it is now considered rather old fashioned.

The idea of a shifting centre of pressure was a mathematical dodge which was invented to explain the nose down pitching moment. It remains a valid idea in the abstract, but the centre of pressure should not be confused with the aerodynamic centre..

The reality is that the effective action of the lift force, providing the wing is not stalling, is at the aerodynamic centre of the wing, close to the quarter mean chord position. If the wing profile is cambered, there will always be a nose down pitching moment in flight, which is usually balanced by the stabiliser.

Since tailplanes and the foreplanes of canards are nothing but small wings, these surfaces have their own aerodynamic centres, found in the same manner, at the quarter mean chord position. Since tailplanes usually have symmetrical profiles, they have no pitching moment of their own, but the point of action of the lift is at their a.c.

Any part of an aircraft in flight and which preserves streamlined flow, has an aerodynamic centre at one quarter of its length from the front. Even a fuselage, if inclined at a suitable angle of attack, will provide some lift, although not efficiently. There is an aerodynamic centre close to a quarter of the distance aft from the nose toward the tail. The same applies to every other streamlined component, including such things as spats and struts.

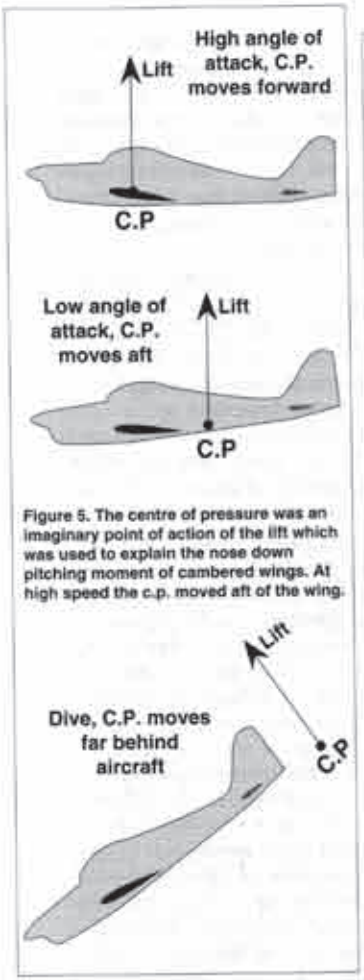


Figure 5. The centre of pressure was an imaginary point of action of the lift which was used to explain the nose down pitching moment of cambered wings. At high speed the c.p. moved aft of the wing.

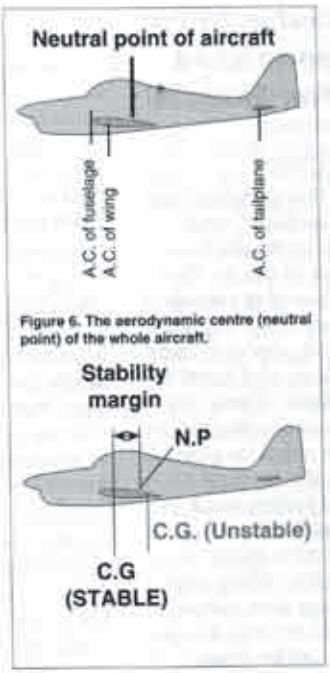


Figure 6. The aerodynamic centre (neutral point) of the whole aircraft.

If the airflow anywhere is generally separated or stalled, this arrangement breaks down, but most well-designed model aircraft have only small areas of separated flow (such as behind a protruding engine cylinder or unfaired wheel) and these are not enough to upset the general situation very much.

All the forces which act at the various aerodynamic centres may be combined, and taken to act at a single point called the aerodynamic centre of the whole aircraft (Figure 6). Since the wing and tailplane (of an orthodox layout) are by far the most powerful lifting surfaces, the combined aerodynamic centre is invariably between the wing and the smaller surface, much closer to the wing than to the tailplane because the wing is larger. With canard aircraft, the combination of forewing and mainplane ensures that the aerodynamic centre of the combination is somewhat ahead of the mainplane.

The modeller hardly ever needs to know exactly where the aerodynamic centre of the aircraft is. To calculate its position approximately is not difficult. It is usually enough to take the wing and tail alone, and ignore the rest.

However, it is significant that the aerodynamic centre of a whole aircraft is also termed the **neutral point** (Figure 6). This is connected with stability and control. If the centre of balance or **centre of gravity** of the model is behind the neutral point, it will be unstable and practically uncontrollable in flight.

If the c.g. is ahead of the neutral point, there will be a reserve of stability, a **stability margin**. The larger the stability margin, i.e., the greater the distance of the c.g. ahead of the n.p., the more stable and predictable the model becomes.

It is possible to make a model too stable, by moving the centre of gravity too far forward. It will then become slow in response to the controls. This, however, is a better fault than an unstable or neutrally stable model, which will be so sensitive that even the most expert pilot will find it impossible to manage in the air. ■

Make a Good Design Better:
How I Personalized The Wasp (Fox Models)

...by Jim Thomas
Woodinville, Washington

Most manufacturers that produce kits for the marketplace are faced with compromises, mainly in production and design. Examples of production compromises are choice of materials (balsa or obechi), degree of completion (pre-sheeted or full kit), sophistication of plans and instructions and number of airfoil options offered. These are generally made because the higher cost of labor and materials must be passed on to the customer in the form of higher prices. Design factors such as the location of CG and towhook (stability), moments and surface volumes (controllability), wing area (wing loading), fuselage size (radio equipment placement) are also areas where compromise must be made. These address the wide variety of equipment and experience levels that the average flier has.

What does this mean to you when you purchase a kit? It means that you are getting a reasonably priced product that can accommodate a variety of skill levels and radio equipment. Throughout all of this, the finished product must be successful in its element, namely flying. However, it may not be all that it can be.

I want to relate my experience in taking a great flying hand launch glider, Mike Fox's Wasp, and making it more suitable to my style of flying. The Wasp as designed has a pod and boom fuselage with V-tail surfaces actuated by pull-pull Spectra line. The wing is triple tapered, balsa on white foam, using a modified SD-7037 airfoil. The stock airplane, with two micro servos, a 4-channel micro receiver and 250 mah battery weighs 11.8 oz, for a wing loading of just over 4 oz/sq. ft.

This ship as designed is wonderful in light conditions and thermals well once cored. The only shortcomings of this great little ship are: 1) typical of two channel V-tails with a long tail moment, turn response is slow; 2) lack of glide path control can be a problem with modern competitive HL tasks; 3) at around 4 oz/sq. ft. it is a little light for maximum altitude hand launches and can have trouble coming home from downwind thermals.

I began my quest to individualize the Wasp by addressing the turning ability and glide path control, and ended up solving all three concerns. The obvious answer was to modify the wing by adding ailerons, flaperons or spoilerons. I chose full span flaperons. (Let me add that I still have the original Wasp wing and fly it occasionally, but I sure like the multi versions better.)

The first attempt involved building another wing with the same planform and airfoil, but modified for flaperons. Since I was going to use flaperons, I knew that I would need to flatten the wing out and modify the dihedral. I decided to use the dihedral schedule from the Falcon 600, namely 5 degrees total at the center of the wing and 10 degrees at the tiplets outboard of the flaperons. I decided early on to kick up the tips for added stability, which proved to be a good move, but more on that later. The wing was built, servos installed, and 1.5" span flaperons cut out and hinged. The revised model weighed just 12.9 oz. (loading of 4.5 oz/sq. ft.) with 4 micro servos, 4 channel micro receiver and 250 mah battery.

First flights were a bit disappointing. The ship launched high and cruised well, but it was very sluggish to turn, regardless of the amount of rudder function mixed in from the V-tail. It responded well to the ailerons, but just didn't carve a turn. Rather than scrap the wing, I decided to increase the center dihedral to see if I could make the tail more effective. The center joint was cut open, sanded to TLAR (That Looks About Right, apologies to Doug Buchanan), and rejoined. On measuring, I had about 10 degrees in the center. The first flight on this revision proved an eye opener. Not only did the ship launch and cruise effectively, it turned like a dream. When 45 degrees of flap were deployed, the ship slowed and settled, but could still be steered effectively with the rudder. I knew that I was onto something. A lot of friends have flown this ship and all were impressed. I sent a sketch of this modification to Mike, which he now includes with his kits. I am also pleased that Mike himself has built and flies an aileron Wasp.

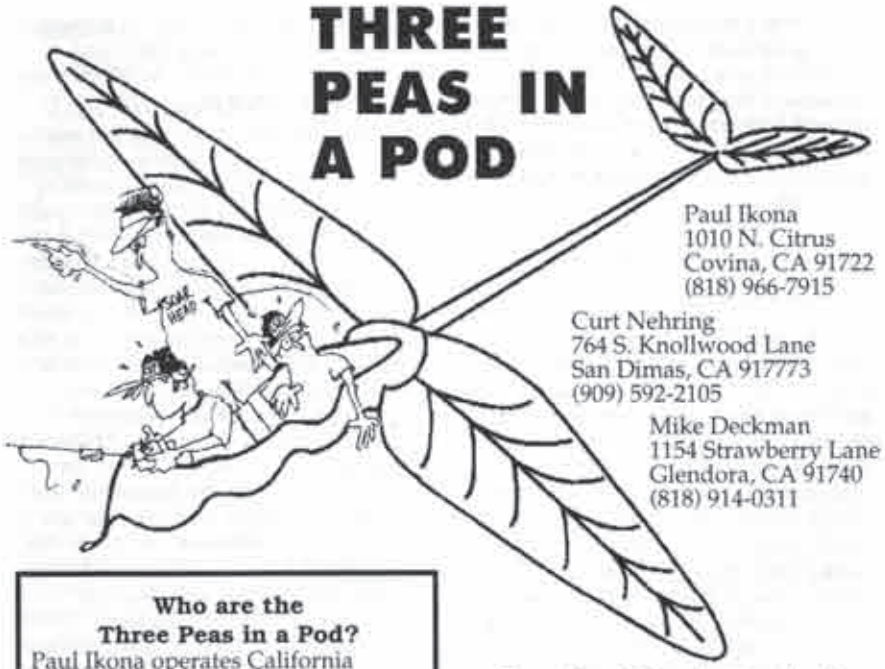
With the success of the wood/white foam wing, I decided to try to increase the durability and weight by making a fiberglass/gray foam wing. Again, I used the same airfoil and planform, and duplicated the dihedral angles and flaperon volumes of my wood/white foam wing. Using mainly 2 oz box weave cloth with 3.6 oz satin weave around the LE for added strength, the ship with this wing weighed in at 14 .1 oz (4.9 oz/sq. ft). True to expectation, it flies great and is pretty durable. As hoped for, it carries energy in the launch better, and has enough mass to make it home from way downwind. I have broken this wing a couple of times. The fix is remarkably simple; just cut a V along the break, trowel in Red Devil filler, or any other one-time spackling material, sand flush and glass across the break onto the intact panel. This version is currently flying at 14.5 oz after two major repairs.

I have made a couple of more changes worth reporting. One was to test Michael Selig's new airfoil, the S-4083. Same planform, glass on blue foam, all up weight 14.2 oz. On this wing, I left the tiplets flat, i.e., only 10 degrees dihedral at the center. After a couple of hours of flying, I decided that the ship was too roll sensitive and fell out of a turn or got off track too easily. I cut the tiplets off, sanded in 10 degrees and reattached them. The stability seen in the Wasp foil wings was back. End of story, I kick up the tips routinely on HL wings for this series. This foil launches as high or possibly a tad higher than the Wasp foil, but has a faster cruise and thermal speed. It should be good in windier conditions, or when lift is very abundant and ranging ability is more important than low speed performance.

The other modification is an answer to making a 60" wing HL more transportable, since I travel to contests outside of driving range. I produced two pairs of fiberglass/blue foam wings that are two piece, using a leftover piece of the 1/4" carbon boom material from the Wasp kit as a joiner. I installed a small stub spar (aluminum tubing, balsa and 1/64" ply shear webs), a small block for anti-rotation pin and dual anti-crush blocks in each panel before bagging the wing. The only difference to the fuse was to accommodate two hold down nylon bolts instead of one. I chose the original Wasp foil for one wing and the S-4083 for the other. On these wings I also installed live Kevlar hinging on the flaperons, making clean, tape-free hinged surfaces. These wings were put onto a Wasp fuse that also was modified so the tail could be removed for traveling. The all up weight of this variant is 14.9 oz (5.2 oz/sq. ft.). Not bad for a fully transportable, 4 servo, all composite hand launch sailplane.

The message I want to leave is this. The kits that we purchase and fly are excellent and are almost guaranteed to fly well. This doesn't mean that they can't be modified and tuned for your personal tastes or needs. I took a good design and feel that I have personalized it to suit my tastes, flying style and ability. With a little thought and experimentation, you too can have the sailplane that you have always dreamed about, but just can't seem to find. ■

THREE PEAS IN A POD



Paul Ikona
1010 N. Citrus
Covina, CA 91722
(818) 966-7915

Curt Nehring
764 S. Knollwood Lane
San Dimas, CA 917773
(909) 592-2105

Mike Deckman
1154 Strawberry Lane
Glendora, CA 91740
(818) 914-0311

Who are the Three Peas in a Pod?

Paul Ikona operates California Soaring Products, a glider only hobby shop and, according to Curt Nehring, keeps a fresh pot of coffee brewing for anyone who happens to drop in to chat. He has been flying sailplanes for about 15 years on and off, and is an active member of Silent Wings Soaring Association.

Curt Nehring's name should be quite familiar to all of you, as he has been doing really neat artwork that has appeared in many newsletters, magazines and, of course, *RCSD* for many years. He is an active member of Silent Wings Soaring Association, and his artwork and articles frequently appear within the pages of their newsletter, *POP-OFF*.

Mike Deckman has been an active member of Silent Wings Soaring Association (SWSA) since 1990. He began soaring in 1972 with the Harbor Soaring Society, and was flying off and on until joining SWSA. His primary interest over the years has been flat land thermal flying. Recently, he has become interested in cross country. Mike is currently the SWSA newsletter editor for *POP-OFF*.

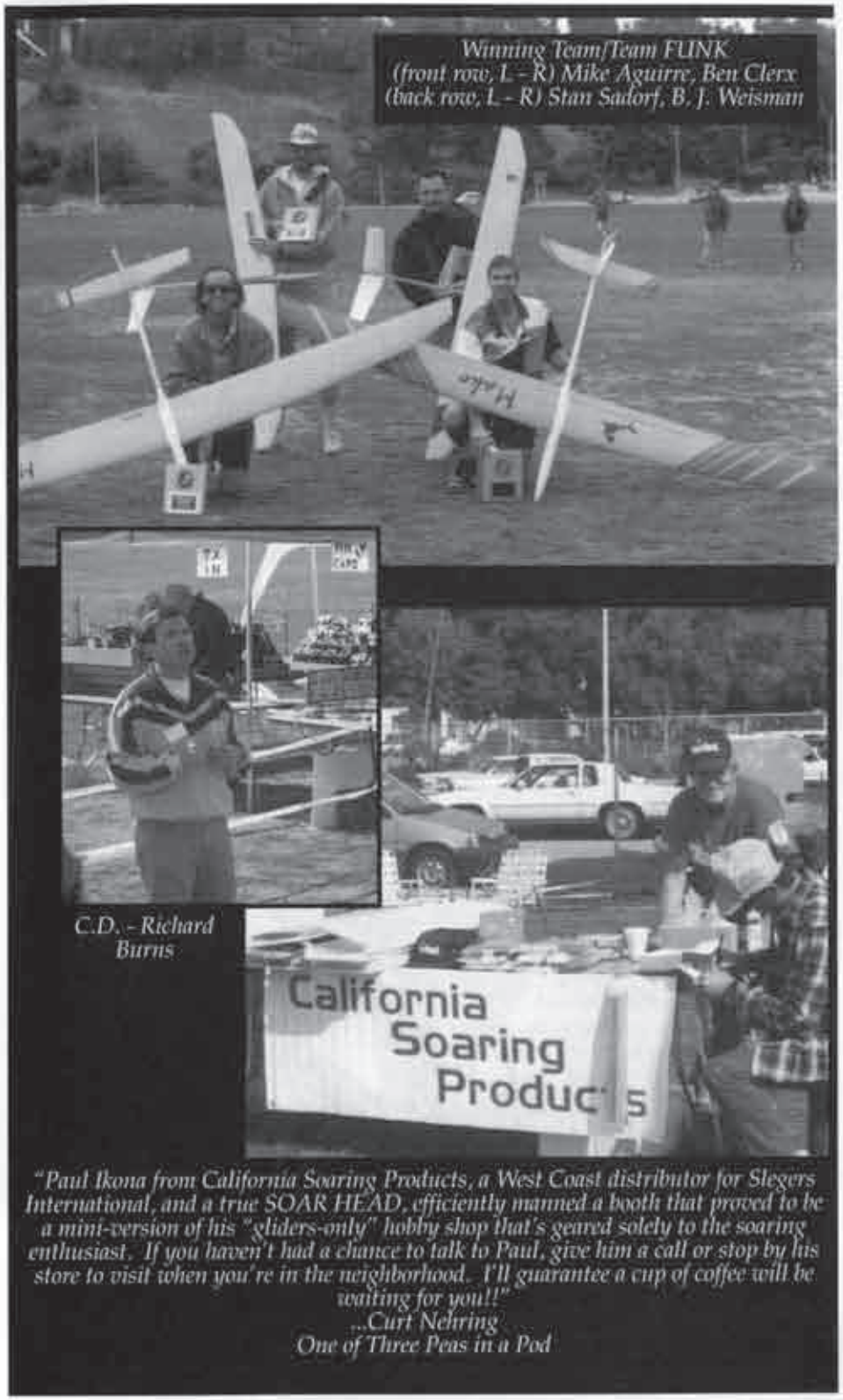
ED ■

Rose Bowl Soaring Festival

For the 14th time, the Pasadena Soaring Society (PSS) hosted its Rose Bowl Soaring Festival; this year it was held on May 5th and 6th. The Festival is now one of the West Coast's "Big Three Triad" of 2 day contests; the other two events of the "Triad" are the Southwest Winter Soaring Contest which is held in February in Gilbert, Arizona, and the Fall Soaring Festival which will be held in Visalia, California in October.

The weatherman predicted opening day gusty winds approaching 25 mph, and calmer conditions for the following day's final rounds. The forecast proved to be right on the money.

During the initial pilot's meeting, C.D. Richard Burns announced the format, which was basically called "flight order" and a mix of "add-em-ups" and "precision duration" with runway-style landings. In explaining the landing task, Rich indicated that the plane must land absolutely straight in the middle of a 7' x 24' box in order to receive 50 points. Twenty-five and ten point bands were to either side. Friendly "boos and hisses" further encouraged Rich to refer to a miniatur-



Winning Team/Team FUNK
(front row, L - R) Mike Aguirre, Ben Clerx
(back row, L - R) Stan Sadorf, B. J. Weisman

C.D. - Richard Burns

"Paul Ikona from California Soaring Products, a West Coast distributor for Slegers International, and a true SOAR HEAD, efficiently manned a booth that proved to be a mini-version of his "gliders-only" hobby shop that's geared solely to the soaring enthusiast. If you haven't had a chance to talk to Paul, give him a call or stop by his store to visit when you're in the neighborhood. I'll guarantee a cup of coffee will be waiting for you!!"
...Curt Nehring
One of Three Peas in a Pod

Tim Renaud and Col. Thacker

occasionally breaking through the clouds. Pilots took advantage of this opportunity to max their rounds, nail some landings, and improve overall standings, although most were substantially behind from the previous day's flying.

Aside from making generous donations to Sunday's raffle, vendors also played an active role hawking their wares, in an almost carnival-like atmosphere, at tables provided by the PSS just adjacent to the pit area.

Airtronics' Tim Renaud is a familiar face on the contest circuit, and represented his company's product line in their typical, up-scale fashion. Gail Gewain, from Composite Structures Technology, offered a wide array of composites, competitive prices, guaranteed

Roger Chastain of Tekoa

ized poster board rendering of the landing zone. With the exuberance of an info-commercial T.V. host pitching the latest slicer and dicer, he went on to add that if the nose or tail settled outside the box, it was a zero! While frequently adjusting the pin-wheeled airplane cut-out attached to the diagram, Burns didn't fail to make his point that pilots landing their gliders beyond target time would also be assessed a 10 point per second penalty. This inspired some groans and nervous laughter, but everyone was ready to fly and seemed up to the task.

Saturday was brutal and peppered with extreme gusts, no noticeable wave, limited thermal activity, downwind landings, and frequent high winds. More survival than flying, few managed to make time or landing points. Two minute flights weren't uncommon and, as the gliders appeared to flounder about the sky out of trim, ballast became a popular topic in the pits. Sunday, on the other hand, was mild and overcast, with the sun

2m winner - Arthur Markiewitz

flights proving the model's spectacular performance and excellent handling characteristics.

A British model aircraft magazine distributor showed up, plus there were other folks offering various connectors and wiring, although we unfortunately neglected to get their names. Mark Hambelton from D.C.U. also made a brief appearance.

Boy Scouts and troop leaders manned a concession booth, and were frequently seen at the BBQ's flipping large quantities of burgers and Polish sausage dogs that were needed to satisfy the ravenous appetites of pilots and spectators, alike. Culinary delight, or not, all in attendance appreciated their fast and friendly service.

There didn't seem to be anything new in airplanes, although rumors abound. Bob Morford

delivery dates, and just overall, friendly responses to any customer inquiries. Sporting a "SOAR HEAD" baseball cap, Roger Chastain stayed pretty busy selling an assortment of pre-sheeted wings packaged in see-through plastic bags; they were a $1.00 per inch. A novel idea!

A talkative Karlton Spindle represented German manufacturer, Multiplex, and demonstrated some fascinating and innovative alternatives in guidance systems, extremely compact hi-torque servos and related options, at a surprisingly reasonable cost. Mark Levoe displayed a meticulous selection of quality fuselages and kits; he has recently been taking advantage of his company's high-visibility and aggressively promoting the new (6 - 7 cell) VARMIT flying-prototype Speed 400 pylon racer. Mark flew post-contest demonstration

Bob Morford & Yee-V-Ko

Open winner - Mike Regan

definitely had the nicest treatment of obechi we had ever seen on a 66 oz. ship he calls the Yee-V-Ko: a Mako fuselage, Sage V-tail, and John Yee designed, high aspect ratio (15:1), wing planform. Ben Matsumoto displayed sets of his custom, glass-bagged wings that are a work of art, light, and extremely strong. Joe uses a set of 7037's on his Peregrine. Any questions?!?

PSS did a fine job of running this contest and making the best of difficult conditions. See you guys next year! ■

Results

Unlimited Class

#	Name	Score	Sailplane	Radio
1	Mike Regan	6808	Thermal Eagle	Vision
2	Steve George	6739	Thermal Eagle	Vision
3	Mark Lowenberg	6732		
4	Mark Aguirre	6731	Mako/Std. Tail	Vision
5	Mark Levoe	6729	Super V 100	Vision
6	Ben Clerx	6728	Mako/Std. Tail	Fut.9ZAP
7	Richard Burns	6718	Own Design	Vision
8	B. J. Weisman	6716	Super V 2m	Vision
9	Steve Condon	6715	Thermal Eagle	Vision
10	Brendon Lugo	6708		

2 Meter Class

1	Arthur Markiewitz	6742		
2	Stan Sadorf	6707		
3	Phil Hallford	6706	Super V 2m	JR
4	B. J. Weisman	6682	Super V 2m	Vision
5	Don Van Gundy	6659		

Review

*AERO*COMP™ Performance Simulator for Electric Flight*

...by Dave Beck
Appleton, Wisconsin

A while ago, I received an irresistible offer from my friend and mentor, Lee Murray. You all know Lee as a frequent contributor to these pages. Well, Lee asked if I would like to review a software package that could simulate electric powered flight performance. Lee (who knows seemingly everything, and everybody) knew that I had been working on a solar powered electric glider. He knew that I had been dreaming of using this plane to challenge a F.A.I. record for distance in a straight line. With all the testing I had been through, he figured I could verify the accuracy of this program. Telling him that I'd do it as a favor to him, I gladly accepted the offer, trying to hold back my excitement.

Flight of any type is a balancing act. As Martin Simon tells us, there are many forces involved, and in stable flight these forces eventually balance. Electric flight is no different; it's just that there are more things to balance, such as the characteristics of motor, propeller, gear box, and battery generate thrust, and the plane responds by increasing its speed until its drag equals the thrust. However, as speed is increased, the thrust changes as the drive responds to the speed change. How does one get a handle on this problem when there are so many variables involved, and very few ways that a modeler can accurately measure them all? For example, there are many ways of building a propeller, but generally the modeler only knows its length and pitch, which do not totally reflect its performance. One can say that there are many intangibles that prevent one from making an accurate prediction. Being an Engineer, I have been trained to be skeptical, and I could see many problems with doing an accurate computer model.

When I received that software, I was further skeptical. The manual comes with long descriptions of how to install it.(It's quite easy.), as well as many testimonials to its greatness, but there is no discussion of how its calculations are made, and there are no definitions or description of inputs or outputs in the manual. The manual says that help screens are available for inputs, but it doesn't say what to do about outputs. It seemed like we are expected to treat the program like a black box. In all fairness, I must say, that most people are not like me. That is, most will want to have a program that they can use to improve their flight performance with, and they don't give a hang about how it works. But for me, I tend to rely on things that I understand, and things that I don't understand I steer clear of, unless I can verify its performance. It's with this mind set that I began to evaluate AERO*COMP™.

The software comes copy protected, with some sort of software key that unlocks it. The key can reside on a floppy disk, or on your hard disk. The floppy disk option allows clubs to pass around this software for its members to use. For those users, each member would load in the software once, and then the floppy disk "key" would be required to start the program. For single users, the program starts up automatically, without a clue to its protection.

This program is available from Tower, Hobby Lobby, and New Creations R/C, as well as others at a retail cost of $79.00. The main author of this program, Paul Ogushwitz, provides an amazing level of support for this program. For Mr. Ogushwitz, this program is a labor of love, and he is continually striving to improve hit. I've talked to him several times, and have found him to be extremely helpful, and eager to explain his product. I haven't found this kind of support for products costing hundreds of dollars more. While talking to him, I have also found that he has a wide range of interests, and has a long affiliation with the aerospace field.

Once this DOS program is loaded and started, the user finds a series of pull down menus. The idea is that the user

goes through these menus fills in values that describe his model. In all there are 27 inputs that the user must enter. The inputs AERO*COMP™ excerpts are in Table 1. Then the user tells it to calculate outputs and 27 values are calculated.

The user sets enter the data required for a basic model, and then tried to improve upon it by changing the inputs, and watching what happens to the outputs. The program allows you to enter in up to 36 model files to its database, and then you "tweak" these models, one input at a time, until you get what you want. You don't have to input all data each time, since it keeps your last values. Other than the value for optimum gear ratio (which is the gear ratio for highest prop RPM - Not longest duration) there is nothing to guide your choices. You simply change something, and then look at the simulation results. However after using this program for a while, you find that you can make 'educated guesses' to improve performance. For example, increasing propeller diameter in general, increases propeller efficiency, and reducing weight gives longer duration. Thus, this program allows you to do tradeoffs in order to optimize your plane. Each time you do a simulation, it takes several seconds to calculate the results on a 486 sx/25 or, if used on an older 8088 style machine, the calculations will take some time.

Amazingly this program allows you to quickly evaluate two of the most difficult choices that a modeler has to make: the airfoil type and the motor type. The current version, version 3, contains data for all of the Soartech 8 airfoils. Also, version 3 contains over 200 motor types and gear box combinations in its data file. This gives the user an amazing number of motors to pick from and to try out before buying! I've check 3 or 4 of the motors listed in this data set, and my measurements using the old drill press/ tachometer method agree quite well with the listings given. While the data given only covers motor resistance (ohms) and dynometer constant (RPM/volt), this is enough to calculate efficiency and many facets of electric motor performance. The fact that so many motors are listed makes this program worth the price! Where else can one find objective data on electric motors? You certainly cannot find objective data in catalogues!

Furthermore, if one has a feel for how motor constants affect flight performance, one can go to these listings and find the motor that one's looking for. The way the program is set up, you have to recall each motor individually to see its constants, which is a little bit of a pain, but one can do it. For example, a motor's resistance affects the maximum efficiency that it can operate at. Lower resistance motors in general can operate at higher efficiency. So one can go through the motor data and look for low resistance motors for that new design. Similarly, dynamo constant affects the gear ratio that's required to spin a prop. The higher the volts/RPM, the less gearing required. It's this sort of knowledge of electric flight that allows one to make the best trade offs, and to converge on 'good' motor combinations. Certainly, if you can save the cost of buying a motor or two, you've paid for the program. Should AERO*COMP™ not have your motor listed, you can measure its characteristics with a drill press, as described in the help screens, and then enter its constants into its database. Its database will hold 100 user defined motors.

Results of AERO*COMP™ simulations

Having used this software for hundreds of simulations, and after a lot of bench and flight testing, I have learned a lot about electric flight and this program. In general, AERO*COMP™ works amazingly well. For designs I've tried, the program has generally predicted the performance I've seen. For example, it predicted that my first electric, an Electrosoar ARF, would not fly out of the box using the motor and propeller that came with it. The broken Electrosoar fuse on my "to repair shelf" is painful evidence that AERO*COMP™ is right! It's also good on predicting my solar plane performance in most cases. To verify its predictions on high speed, high performance planes, Kirk Massey at New Creations R/C was kind enough to supply me with some ball park data.

TABLE 1

AERO*COMP™ Inputs And Outputs

Inputs	Outputs
Number of Motors	Full Throttle RPM
Motor Resistance	Full Throttle Voltage
Dynamo Constant	Full Throttle Current
Gear Ratio	Full Throttle Thrust
Battery per Motor	Full Throttle Duration
Cell Capacity	Full Throttle Input Watts
Cell Voltage	Full Throttle Output Watts
Cell Impedance	Motor Efficiency
Wiring Resistance	Optimum Gear Ratio
Circuit Type	RPM at Optimum Gear Ratio
Blades per Prop	Wing Area
Prop Diameter	Wing Aspect Ratio
Prop Pitch	Wing Loading
Number Wings	Takeoff Distance
Wing Span	Takeoff Duration
Wing Midspan	Takeoff Airspeed
Wing Root Cord	Thrust Duration At Takeoff Speed
Wing Tip Cord	Max Airspeed for prop rotation
Wing Thickness	Max Airspeed for Air Drag
Air Foil Type	Reynolds Number at Max Speed
Fuse Type	Max Rate of Climb
Landing Gear	Climb Angle
Runway Type	Max Altitude at Full Throttle
Runway Elevation	Max Lift to Total Drag Ratio
Total Weight	Max Glide Duration
Number of Cells	Max Total Duration
Fuse Area	Will Aircraft Fly?

Again, AERO*COMP™ seemed to generally agree with observed performance. But there are several cases where it hasn't predicted flight performance. In these cases, it takes some digging to figure out why. Of course, there are 27 inputs that AERO*COMP™ uses, so that gives you 27 inputs to check for "correctness". It may be impossible to verify all inputs, but I've found that often the problem lies with the propeller one is using. Most of the propellers I've purchased are not the pitch marked by the manufacturer or are of oddly varying pitch along their length. This explains some of the simulation problems I've seen. When developing this program, the author, Mr. Ogushwitz, said this was one of his biggest problems too, especially given the flexible nature of plastic propeller, so he did his testing with wooden propeller.

Another problem I've noticed with AERO*COMP™ is its behavior when looking at certain performance trends it predicts. Specifically, if one changes airfoil thickness, and looks at what happens, one finds amazing increases in rate of climb and flight duration. For one hypothetical condition I've tried, changing the airfoil from 10.8% to 1.3% thickness caused the flight duration to change from 26 minutes to 43.6 minutes. This is a 167% increase in flight time! Furthermore, decreasing wing thickness further causes AERO*COMP™ to predict further increases in flight time. Paul says that this is due to decreases in drag, and that you couldn't build airfoils that thin anyway. I say that there should be a change in lift as well as drag with changing foil thickness, so performance should not always get better the thinner the wing. NACA foil tests show that I am correct for NACA 66 and 65 series, and that maximum lift

coefficient does eventually decrease with decreasing wing thickness. So from my standpoint, this program gives best results for foils near their nominal tested thickness values.

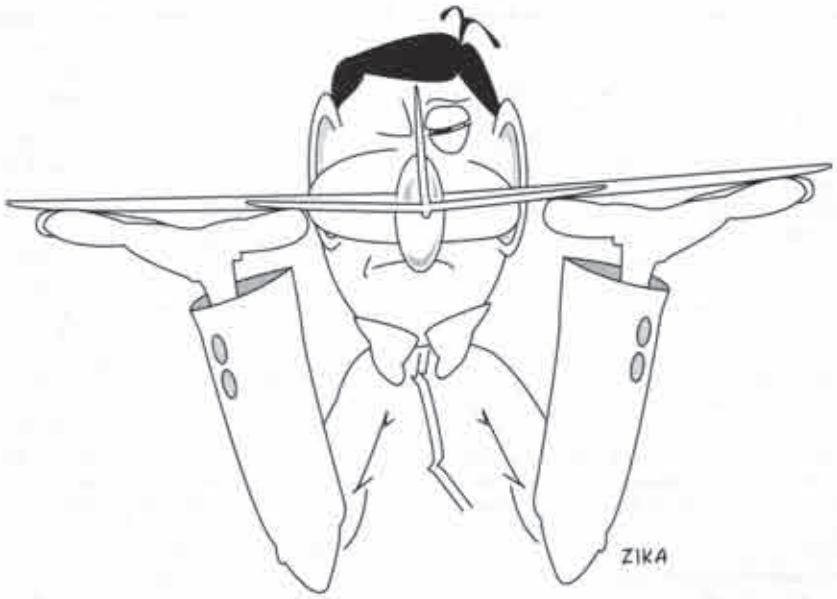
From the above paragraph, you might think that AERO*COMP™ is a little limited in its accuracy of prediction. For practical purposes of improving flight performance, I've found the above problem to matter little. The best approach is to use AERO*COMP™ as a guide to get you to better performance. This is done best by adjusting the inputs to AERO*COMP™ until it predicts performance that is very much like your model. Generally, this is not hard to do, and if it does require a lot of adjustment, there may be something wrong with what you think your model is. Once you've got your model right, you can make adjustments to the computer inputs until the computed performance is the way you like it. Next, one would build or change the model and measure its performance, and compare it to what the computer said. In doing this, I've found that I've always gained insight in understand my model better. If you do this process several times, your flight performance will improve substantially. For example, when I first built my latest duration electric, it had very poor performance. It required 7 1800ma cells and gave me about 10 minutes of flight. However, after using this program, as well as bench and flight tests, I was able to improve performance to the point where I was getting about 30 minutes with 6 1400 ma cells. But It took me several iterations to get these results. I had to first understand how my plane was working, and then I had to find where the plane was falling short of, or was exceeding, simulation input values.

In conclusion, AERO*COMP™ is a great program for flight improvement, and can save one a lot of time and money. It provides a quick, easy way to find areas for improving a plane. However, for best results, one must get "involved" with the process.

Kirk Massey, New Creations R/C, P.O. Box 496, Willis, TX 77378; (409) 856-4630

Paul Ogushwitz, USR&D, P.O. Box 753, Hackettstown, NJ 07840-0753; (908) 850-4131

■



Tired of the Same Old Thing?

...by John Raley
1375 Logan Ave.
Costa Mesa, CA 92626
(714) 641-1776
E-mail: E-flyer@netcom.com

Want to design and build something totally different that will take all you have learned about lift, drag, and stress? Then I invite you to build an electric cargo plane for the Astro Champs weight lifting competition. I know this is a little weird and off track for most of the *RCSD* readers but this event will take the best in design and building and I want to get the word out to those who qualify. This will take all you have learned and give you a whole new set of parameters to apply it to. A lot of you are well aquatinted with electric power, so find out what it can really do! The basics are the same, a good high lift low drag airfoil and a clean lightweight structure, add an Astro motor and a sturdy set of wheels and you've got it.

September 23rd and 24th of this year the Southern California Electric Flyers will be hosting the 25th annual Astro Champs at Mile Square Park, in Fountain Valley California. There will be many events including Pylon Racing, Aerobatics, and Scale, but the event that really gets the attention is the 7 cell Cargo Competition. It's the only flying event I have seen that gets rousing cheers from the crowd after each flight. In the last event, Chuck Hollinger's plane won carrying over 12 lbs. of lead! The rules are pretty simple. Basically, you rise off the ground in 150 ft., fly for 1 minute and land in one piece. This must be done with any Astro motor, geared or not, with only a 7 cell battery pack. No limit on plane size. (Official rules will follow.) The Onus II was my entry in 1993, and it did well caring 13.2 lbs. of lead, but a hard landing by yours truly busted the wing. This year, we have shortened the take off space to 150 ft. so the plane that gets off in that distance won't be flying so close to a stall. We hope this will preserve more planes. Although my weight lifter still flies, many who got off in 200 ft. never made it back. Hopefully, the 150 ft. rule will let those that get off in that distance fly with some control and those that don't can try again.

This event is a lot of fun and will give you a chance to build a wing with an airfoil that has some real curves to it. (Hollinger's plane used a Wortman FX63-137.) I hope some of you out there will give it a shot. Team efforts are great and encouraged. With the shorter runway we expect to see 10 to 12 lbs. of lead lifted, but who knows?

For more information call or write to: Southern California Electric Flyers, 1375 Logan Ave., Costa Mesa, CA 92626, Ph: (714) 641-1776, Fax (714) 641-1050. ■

Electric R/C Cargo Competition Rules for 1995 Astro Champs

1. Power

A. Any size Astro-manufactured motor will be allowed. Multiple Astro motors will be allowed. Any type or ratio gear box will be allowed. Any size or pitch propeller / propellers will be allowed.

B. Battery pack must be no more than 7, 1.2 volt nickel cadmium cells no greater than 1700 mah capacity. No other type of device or component may be used for storage of electrical power.

C. All components must be available for inspection by a contest official.

2. Plane

A. There are no limitations on wing span or area.

B. Cargo space must be a single area, 30 cubic inches minimum.

C. Cargo weights must be supplied by the contestant.

D. Weight increments shall be 1/4 pound (4 ounces) minimum.

E. Plane must be safely flyable after each flight without repair.

F. Nothing may be dropped from plane during or after take off or while landing.

3. Flight

A. Plane must lift off in 150 feet maximum.

B. Plane must stay aloft for 1 minute minimum.

C. Plane must land intact in landing area.

F. Cargo weights will be weighed by contest official after each flight.

TIDBITS & BITS

Southern California Electric Flyers

The following is from John Raley of Costa Mesa, California.

"...I would like to have our club included in your R/C Soaring Resources. The SCEF is now in its third year and growing steadily. We fly primarily at Mile Square Park in Fountain Valley, California, and have a diverse group of flyers. We fly thermal duration, scale and sport. On a typical flying day, one might see a Falcon 550E, Fleet Biplane, Electro Streak, and a Goldberg Electra in the sky. Many of our members fly slope and winch-launched gliders. We have some very knowledgeable members, and would like to make ourselves available to answer questions."

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

A Club in Michigan

We received a newsletter called *MISS Information*, which is the official publication of Michigan International Soaring Society. The newsletter editor and president is Norm Sorensen, 18939 Wormer, Detroit, MI 48219; (313) 534-0356.

An Invitation from Florida

The following was sent in by Tom Galloway of Maitland, Florida.

"This note is an invitation to join us in sunny Florida next fall when the Orlando Buzzards host several soaring contests. On September 23 and 24, we will host Florida Soaring society Contest #9 at our Snow Hill Road contest site, with 2 meter on Saturday and Open on Sunday. The following month, we will hold a Gentle Lady (One Design) Contest at our home field site; the date is October 29. In November, we will host the 22nd Annual Tangerine Soaring Championship at our Snow Hill Road Contest site. (That's really the 22nd! We've been doing this for awhile!) November 24th will be the 2 meter event, and separate Open events will be held on November 25th and 26th.

"These contests are thermal duration with precision landings. Specific tasks are at the Contest Director's discretion, but each contest typically consists of five to seven rounds of 7 to 15 minute duration tasks. Trophies are awarded each day for the first three places in each of three pilot classifications: sportsman, expert, and masters. In addition, we try to hold an informal club contest in conjunction with our monthly meetings, usually the first Sunday of each month, at our home field site.

"Come fly with us!"
Points of contact are:
Hank McDaniel
1218 Roxboro Rd.
Longwood, FL 32750
(407) 831-3688

Rick Eckel
696 Brown Bear Court
Winter Springs, FL 32708
(407) 365-9757

Submitted by:

Tom Galloway (Club Secretary)
2173 Mohawk Trail
Maitland, FL 32751

From Montreal, Canada

The following is from Dan Gregory of Quebec, Canada.

"For the twentieth time in succession, our club will be hosting its two day, glider soaring contest and it's called appropriately, "The MATS 20th Annual Soaring Contest".

"This contest is renown in the North-Eastern USA and in Eastern Canada, attracting top competitors of both our countries from the states of New York, Vermont, New England and New Jersey, and from the Provinces of Quebec, Ontario, New Brunswick, Nova Scotia, and P.E.I. The two day event has 30 to 35 contestants per day and a BBQ at the home of one of the club members in between, to make or renew friendships.

"...The club gives cash prizes to the First Place Grand Aggregate Winners in Expert and Sportsman categories, as well as Hero Medals to third place each day. The MATS club members work very hard to make the contest a success."

Montreal Area Thermal Soarers
Dan Gregory, Secretary/Treasurer
1995 Contest Coordinator
102 - 5260 Riviera St.
Pierrefonds, QB
Canada H8Z 3H2
(514) 684-1795

This event is on August 5th & 6th.

■

Classified Advertising Policy

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

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

For Sale - Business

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

PLANS - R/C Sailplans - Scale, Sport, and Electric. Old Timer, Nostalgia and FF Scale and Sport-powered, rubber and towline. All models illustrated. Formerly B^2 Streamlines Plans Service. Catalog $2.00. Cirrus Aviation, P.O. Box 7093, Depot 4, Victoria, BC V9B 4Z2, Canada.

FOAM CORE WINGS - high quality, 1# white bead board foam wing cores for 1/3 scale ASW 19/20. E-203 airfoil, 4 piece set. Plywood root ribs available. Contact Roy Simpson, 53260 Monterey Dr., Bristol, IN 46507; (219) 848-5973 eve.

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

"REAL BALLS" Ball Bearing endplates for Ford longshaft starter motors. $120/set + $5.00 ship. Coming soon! Top quality F3J reel and pulley set, ultimate sanding bar. NEW ADDRESS: Douglass Boyd, 29918 SE Davis Rd., Estacada, OR 97023; (503) 630-4451, (503) 630-3515 msg.

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

For Sale - Business

Spring Price Buster Sale: RCD Micro 535 receiver $69.95, RCD HS80 Micro Servo $29.00, Airtronics 94501 Microlite Servo $42.90, Airtronics "Vision" 8 channel VS8SP FM PCM complete system with 3 #831 mini-servos $639.00. Send SASE for complete sale flyer. Sky Bench Aerotech, P.O. Box 316, Washington, MI 48094.

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

For Sale - Personal

NIB kits: Legionaire 140... $250.00; Airtronics Grand Esprit... $250.00; Bob Smith Sundancer II... $100.00; Esteem 110... $280.00. Prices do not include shipping. Tom Gressman, (303) 979-8073, Colorado.

Shadow 120, brand new, pre-sheeted wings, newest version w/more CF and tapered-cut flaps & ailerons w/LE, TE caps and tips installed... $145.00 + shipping. Steve Pasierb, (410) 661-6641, Maryland.

ULTRA GP 55 3/8" molded wingeron, receiver only needed to get airborne, Airtronics 680Z 732 & JR341 installed, easy switch over for Futaba, extra tail section included with original packaging and paperwork, flies great at 27 oz. in 35 mph winds... $300.00 + $25.00 shipping US; LASOAR 650, electric, 5 turn .05, 1700X7, Flightec speed control, JR341 in tail, building of obechi wing only needed... $399.00 + $25 shipping US. Daniel Danrich, (808) 665-0314, Lahaina, Hawaii.

Ellipse I, all molded F3B sailplane with six metal-geared servos and 1200mah batt., extremely competitive in all tasks, capable of sub-20 speed unballasted (96 oz. flying weight), same design as '93 World Champ... $850.00 RTF. Adrian, (808) 839-0885, Honolulu, Hawaii.

Synergy III SE, one of the first "SE" models out of the molds, blue & white in color. The SE is the one that's lighter-weight with large flaps and ailerons, suitable for all flying conditions from AMA contests to slope races. Good condition, never crashed, can be purchased with six 141 servos and a 1000mah battery for $595.00, or without the servos... $395.00. To make an offer on this great sailplane, call Steve Condon, (619) 594-7823 (W), (619) 630-2909 (H), So. Calif.

Mariah 2m kit, NIB w/professional construction video... $125.00. Rolf Beere, 617 Zinnia Ct., Sonoma, CA 95476; (707) 935-7705, fax (707) 939-0887.

For Sale - Personal

1/3 Discus, over 5 meter span with all servos rigged for Futaba, includes airtow nose release and retractable wheel, with cockpit detail... $1500.00; 1/3 Club Libelle (Krause), 5 meter span with servos rigged for Futaba, with nose release, absolutely ready to fly... $1400.00; Twin Astir (Wik), 4 meter, all glass, excellent condition, completely finished, ready to fly, slight hangar rash, immaculate detailed twin cockpit, competition worthy, 4 meter wing span with all servos rigged for Futaba radio, nose tow release for airtowing... $1000.00; Thermoflug all glass, 4 meter, Salto with Futaba servos, slight hangar rash, absolutely ready to fly... $900.00; Krause Libelle, 5 meter span, ready to fly, brand spanking new, never flown... $1300.00; Robbe ASW 24, 3.5 meter, 900ma battery plus 8 Futaba servos, airtow release in the nose with flaps, slight damage to the stab, otherwise completely ready to fly... $200.00. Robin Lehman, (212) 879-1634, New York.

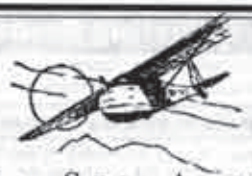
Wanted

Left wing for Multiples 6a6e, or a pair of wings. Ron Wahl, (315) 331-7417, NY.

Gliders. All conditions considered. All gliders and parts considered, old or modern. F3B Eagle, Synergy 91 type gliders, any brand. Any 100 to 140 inch carbon fiber gliders or wings, 7037 - RG15 preferred. Scale gliders: Baby Boas, Albatross, Minimoa. ASW 20 or 25, 10 to 20 feet. Jerry Nelson KA6, 12 ft. glider or parts. Hobbie Hawk parts. Left wing, tail feathers and rudder needed. Slope gliders 60" - 130". Have 4 - 5 slope gliders for sale or trade, blue foam RG 15's, 6 panel wings, 12 or 14 feet, plywood covered or unfinished. Other misc. kits. Gene Molnar, 5362 Aurelia St., Simi Valley, CA 93063; (805) 527-8582.

Vision 8SP, well cared for, reasonably priced, with or without servos, etc. Any channel. Michael @ (206) 631-8269, 9am - 9 pm, Washington.

ZIKA



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

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

R/C Soaring Resources

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

Contacts & Soaring Groups - U.S.A.

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

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

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

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

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

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

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

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

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

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

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

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

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

Maine - DownEast Soaring Club (New England area), Steve Savoie (Contact), RR#3 Box 569, Gorham, ME 04038; (207) 929-6639. InterNet e-mail <Jim.Armstrong@acornbbs.com>.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Outside U.S.A.

Australia - Southern Soaring League, Inc. (SSL), Mike O'Reilly, Model Flight, 42 Maple Ave., Keswick SA 5035, Australia. Phones: ISD+(08) 293-3674, ISD+(08) 297-7349, ISD+(018) 082-156 (Mobile). FAX: ISD+(08) 371-0659.

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

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

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

Hong Kong - Robert Yan, 90 Robinson Road, 4th Floor, Hong Kong; (852) 5228083, FAX (852) 8450497.

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.

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/Internet

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

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

Internet - Email list/resource of RC soaring related folks, including US and international club contacts, vendors, kit manufacturers/distributors, software, equipment and supplies. Also a resource for aeromodelling related WEB sites on the Internet. Contact Manny Tau at taucom@kaiwan.com, or on CompuServe: 73617,1731.

Hobby Shops that Carry *RCSD*

Action Hobbies
3723 S. Mendenhall
Memphis, TN 38115
(901) 365-2620

Air Capital Hobbies
8989 West Central
Wichita, KS 67212
(316) 721-4164

California Soaring Products
1010 North Citrus
Covina, CA 91722
(818) 966-7215

Finney's Hobbies
3455 Peachtree Industrial Blvd., Ste. 980
Duluth, GA 30136
(404) 495-8512
(404) 495-8513 fax

Gunnings Hobbies
550 San Anselmo Ave.
San Anselmo, CA 94960
(415) 454-3087

Gyro Hobbies
23052 Lake Forrest Dr., Unit C2
Laguna Hills, CA 92653
(714) 583-1775

HiTecHobbys
284 - B Wellsian Way
Richland, WA 99352
(509) 943-9241

Hobbies'N Stuff
9577 L Osuna Rd. NE
Albuquerque, NM 87111
(505) 293-1217

Hobby Counter
1909 Greenville Ave.
Dallas, TX 75206
(214) 823-0208

Hobby Town USA
8090 S. 84th St.
La Vista, NE 68128
(402) 597-1888

Hobby Warehouse
4118 South Street
Lakewood, CA 90712
(310) 531-8383

Tim's Bike & Hobby
2507 Broadway
Everett, WA 98201
(206) 259-0912

Schedule of Special Events

Date	Event	Location	Contact
June 15-18	Mid-South Champs (International Contact)	Huntsville, AL	Ron Swinehart, (205) 883-7831 Tom Ernst, (901) 767-9518
June 17	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
June 17	MAN-ON-MAN	Dayton, OH	Ken Davidson, (513) 864-1774
June 18	MAN-ON-MAN	Dayton, OH	Jerry Shape, (513) 843-5085
June 17-18	Fathers Day North/South Challenge	Visalia, CA	Ed Hipp, (209) 625-2352
June 17-18	LISF Empire State Soaring Classic	Syosset, NY Long Island	Taylor Fiederlein, (516) 922-1336
June 17-18	ORCC Annual Thermal	Manotic On, Canada	Ken Norris, (613) 820-9097
June 18	SOAR Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
June 18	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
June 18	MARCS Thermal Blast	Madison, WI	Al Scidmore, (608) 271-5500
June 23-25	SOAR Mod. F3J Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
June 24	TPG Fun-Fly & BBQ	Torrey Pines, CA	Steve Stricklett, (619) 741-1037
June 24-25	TNT Open	San Antonio, TX	Perry Van, (210) 658-8842
June 25	Triathalon	Coteau Station, Canada	Dan Gregory, (514) 684-1795
July 1-2	WRCC Summer Soar-In	Sedgwick County, KS	Pat McCleave, (316) 721-5647
July 1	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
July 1	TPG HLG Contest	Poway, CA	Art Markiewicz, (619) 753-3002
July 2	11th Annual HL Contest	Dayton, OH	Gale Leach, (513) 429-2543
July 2	F3J Tune-up	Coteau Station, Canada	Dan Gregory, (514) 684-1795
July 8-9	Kansas Flatland Open	Kansas	Ed Kempf, (913) 780-5543
July 9	HLG Contest	Dallas, TX	Bud Black, (214) 235-0867
July 12-13	COGG XC Dash for Cash	Cookstown, Ontario	Jack Nunn, (707) 728-4467
July 14-16	Canadian Nationals	Barrie, Ontario	Neil Tinker, (416) 491-5823
July 15	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
July 15	MARCS 1.5M HS/HL	Madison, WI	Al Scidmore, (608) 271-5500
July 15	Ohio Cup HL & STD	Dayton, OH	Bob Massmann, (513) 382-4612
July 16	Ohio Cup 2m & UNL	Dayton, OH	Jim Martin, (513) 376-9046
July 15	HL/Open	San Antonio, TX	Mike Howell, (210) 657-3332
July 15-16	SOAR 95 (Unl, 2M)	Redmond, WA	Jim Thomas, (206) 488-2524
July 16	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
July 16	July Jamboree	Rochester, MI	Jack Iafret, (810) 694-2490
July 16	Hand Launch	Ste.JULIE DE V., Canada	Dan Gregory, (514) 684-1795
July 21-24	Wasatch Mt. Scale/PSS Soaring Festival	Pt. of the Mt., UT	Bob Harman, (801) 571-6406
July 22-23	SWIFT/Western XC	Mead, NE	Christopher Knowles, (402) 330-5335
July 23	SOAR F3B Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
July 29-Aug. 6	NATS - Soaring	Muncie, IN	
July 30	Triathalon	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Aug. 4-6	Fun Fly	Cape Blanco, OR	Randy Banta, (503) 664-5025
Aug. 5-6	MATS 20th Annual/Coteau	Station, Canada	Dan Gregory, (514) 684-1795
Aug. 12-13	ORCC - XC	Manotic, On., Canada	John Elliot (613) 729-9395
Aug. 12-13	Thermal Grabber UNL/2m	Redmond, WA	Jim Thomas, (206) 488-2524
Aug. 13	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Aug. 18	Dawn-to-Dusk Challenge	Everywhere - Jimmy Prouty, prouty@emh.kadena.af.mil	
Aug. 19	Handlaunch	San Antonio, TX	Jerry Caldwell, (210) 438-4077
Aug. 19	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Aug. 19-20	SBSS Summer Classic	Gilroy, CA	Scott Meader, (408) 244-2368
Aug. 20	SOAR Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
Aug. 20	MATS-ORCC Duel	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Aug. 27	Slope Soaring	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Sept. 2	SASS HL 2	Redmond, WA	Joseph Conrad, (206) 630-2670
Sept. 9	TPG HLG Contest	Poway, CA	Art Markiewicz, (619) 753-3002
Sept. 9	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Sept. 9-10	13th CASA Open	Gaithersburg, MD	Steven Lorentz, (301) 845-4386
Sept. 10	Grand National Nostalgia	Rochester, MI	Jack Iafret, (810) 694-2490
Sept. 10	7th Annual	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Sept. 16	2M/Open	San Antonio, TX	Gene Warner, (210) 732-3101
Sept. 16	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Sept. 16-17	Pensacola Contest	Pensacola, FL	Cornfed, (334) 660-1318
Sept. 17	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Sept. 17	SOAR Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
Sept. 17	Team Duration	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Sept. 23	MARCS F3J	Madison, WI	Al Scidmore, (608) 271-5500
Sept. 23-24	Astro Champs	Fountain Valley, CA	John Raley, (714) 641-1776
Sept. 23-24	2m & Open	Orlando, FL	Hank McDaniel, (407) 831-3688
Sept. 24	F3J	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Oct. 1	Great Pumpkin	Coteau Station, Canada	Dan Gregory, (514) 684-1795
Oct. 7	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Oct. 7-8	Fall Soaring Festival Western States Triad	Visalia, CA	
Oct. 7-8	SOAR Fun Fly	Plainfield, IL	See Illinois R/C Soaring Contacts
Oct. 14	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Oct. 14	TPG Unltd. Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Oct. 15	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Oct. 14-15	Fall Soaring Tournament	Memphis, TN	Bob Sowder, (901) 757-5536
Oct. 14-15	2m & Unl.	Morriston, FL	Frank Strommer, (813) 844-7225
Oct. 15/18	Slope Soaring	Cape Cod	Alex Wenzl, (514) 984-7957
Oct. 21-22	Canyon Lake Classic	Canyon Lake, TX	Greg Dickerson, (210) 656-1796
2M, Open, HL - Potters Creek Park			Tom Meeks, (210) 590-3139
Oct. 21	1.5m Hi-Start Contest	Washington, MI	Ray Hayes, (810) 781-7018
Oct. 22	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Oct. 22	SOAR Contest	Plainfield, IL	See Illinois R/C Soaring Contacts
Oct. 29	One Design Contest	Orlando, FL	Rick Eckel, (407) 365-9757
Nov. 4-5	2m & Unl.	Morriston, FL	Ken Goodwin, (904) 528-3744
Nov. 4	TPG HLG Contest	Poway, CA	Art Markiewicz, (619) 753-3002
Nov. 5	TPG Fun-Fly & BBQ	Poway, CA	Steve Stricklett, (619) 741-1037
Nov. 5	SOAR Turkey Shoot	Plainfield, IL	See Illinois R/C Soaring Contacts
Nov. 11	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Nov. 12	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Nov. 19	Open	San Antonio, TX	Perry Van, (210) 658-8842
Nov. 24-26	22nd Tangerine	Orlando, FL	Ed White, (407) 321-1863
Dec. 9	TPG 60" Slope Race	Torrey Pines, CA	Eric Larson, (619) 793-7640
Dec. 10	TPG Thermal Contest	Poway, CA	George Joy, (619) 748-2167
Dec. 9-10	Winter Soaring Festival	Indio, CA	Buzz Waltz, (619) 327-1775

ATTENTION Boston, Massachusetts Subscribers

If you live in Boston, or have friends that live in the Boston area that fly sailplanes, this notice is for you! Are you looking for a flying site? Well, Ken Griffin has some ideas about how to get one, and he wants to hear from you!

Ken Griffin
27 Rodman St.
Jamica Plains, MA 02130

(617) 522-7628 (H)
(617) 635-0444 (W)
FAX (617) 635-0198

Advertiser Index

Advertising

VIGILANTE

OPEN CLASS SAILPLANE

Hollow molded construction & Spyder foam cores.

Specifications

Span	118" (3m)
Area	1017 sq. in.
Weight	70 - 74 oz.
Loading	9.9 - 10.5 oz./sq. ft. (Unballasted)
Airfoil	SD7037
Kit Price	$489.00
Ready-for-Servos Price	$799.00

Prices do not include S&H.
Calif. res. please add tax

Features

- ✘ Three-piece, bolt-on wing uses carbon joiners.
- ✘ Wing outer ply is Kevlar for torsional stiffness, and provides integral skin hinges for ailerons and 90° flaps.
- ✘ Carbon spar caps are under core to provide better contour, while still providing exceptional strength and stiffness.
- ✘ Vacuum bagged fuselage is Kevlar reinforced glass with Spyder foam reinforcing in the fin.
- ✘ Wing, fuselage, and stabs are pre-painted with a durable epoxy paint.

Sailplane Systems
1222 S. Cypress Ave. Unit G
Ontario, CA 91762
(909) 391-2838

In Southern California? Call to fly before you buy!

A-10 WARTHOG

Slope Soaring at its finest!

Mountain Wings Manufacturing is Proud to Present

The Gregg Goris Designed A-10 Warthog

Specifications	*Features*
Span: 45.4 inches	*Accurate Scale Outline*
Length: 30 inches	*Realistic Flight Characteristics*
Weight: 24 - 30 oz.	*Balsa Sheeted Foam Wing*
Wing Loading: 12-15 oz/ft²	*Vacuum Formed Fuselage, Nacelles and Canopy*
Airfoil: S4233 Tripped	*Complete Kit Including CAD Plans and Detailed Instructions*
Controls: Ailerons & Elevator	

Recommended for All Skill Levels

Introductory Price $84.95 + S&H

Order From: Mountain Wings, Alex Paul (603) 357-7042
Soaring Specialties, George Voss (405) 692-1122
Also Available From Selected Dealers

AN INNOVATIVE NEW DESIGN FOR THERMAL DURATION CONTEST SUCCESS

ESTEEM
COMPETITION SAILPLANES

ESTEEM 110

Span 110 Inches
Airfoil SD7080 Modified
Wing Loading 9.6 Oz/Sq.Ft.
Wing/Stab Pre-sheeted obeche over foam
Weight 52 Ounces
Fuselage Legnth 54 Inches
Wing Area 940 Square Inches
Stabilizer Area 104 Sq. Inches
Aspect Ratio 14.6:1
Maximum Ballast 8 Ounces

ESTEEM 121

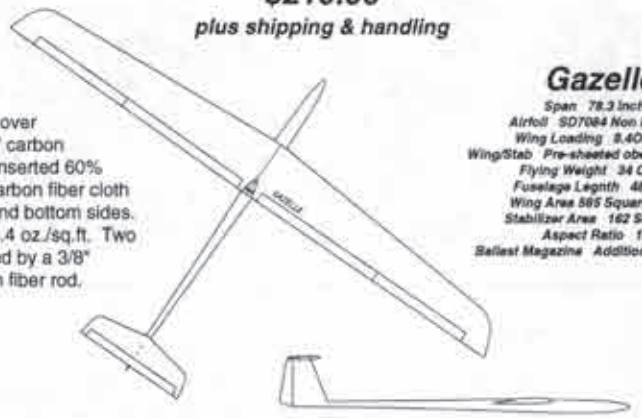
Span 121 Inches
Airfoil SD7080 Modified
Wing Loading 9.2 Oz/Sq.Ft.
Wing/Stab Pre-sheeted obeche over foam
Weight 56-58 Ounces
Fuselage Legnth 54 Inches
Wing Area 1005 Square Inches
Stabilizer Area 110 Sq. Inches
Aspect Ratio 16.2:1
Maximum Ballast 8 Ounces

The Esteem is a truly engineered sailplane and for this reason alone its characteristics in performance are unequal. We have compared it with almost all other major sailplane models and we are proud to report that Esteem could not find its equal. You must fly one to understand where we have taken model sailplane capabilities.

Purchase Direct from Manufacturer
Either Kit only
$349.00
plus shipping and handling

Gazelle 2 Meter Sailplane

$210.00
plus shipping & handling



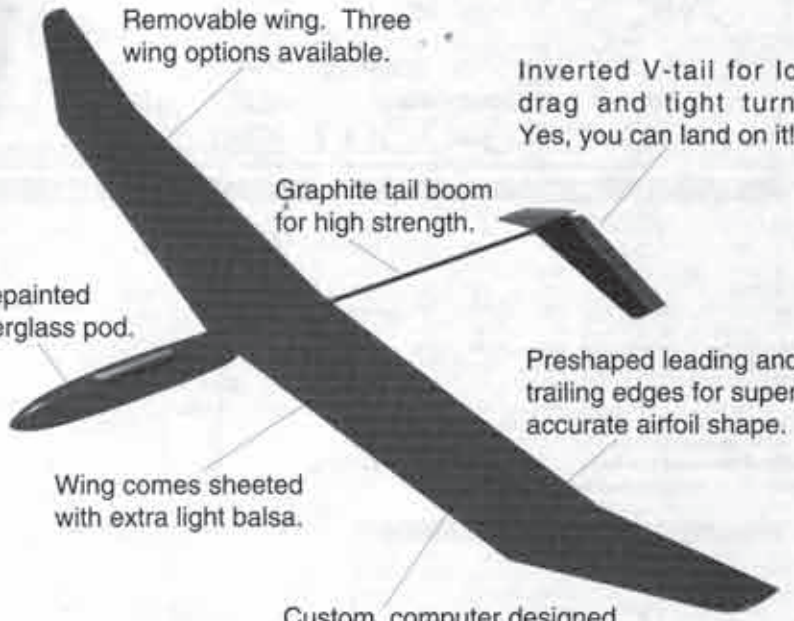
Wings are sheeted obechi over foam with a 3/8" carbon fiber spar tube inserted 60% of the legnth. Carbon fiber cloth reinforced top and bottom sides. Weight is only 8.4 oz./sq.ft. Two piece wing joined by a 3/8" diameter carbon fiber rod.

Gazelle

Span 78.3 Inches
Airfoil SD7084 Non Modified
Wing Loading 8.4Oz/Sq.Ft.
Wing/Stab Pre-sheeted obeche over foam
Flying Weight 34 Ounces
Fuselage Legnth 48 Inches
Wing Area 585 Square Inches
Stabilizer Area 162 Sq. Inches
Aspect Ratio 13:1
Ballast Magazine Additional 16 Ounces

At 34 oz. all up weight, 8.4 oz./sq.ft. loading, fiberglass kevlar fuse, foam obechee and carbon fiber tape wing construction make this sailplane something you were missing if you have never seen real launches, speed runs, cork screw thermaling and simply a flying joy. Fly one! Electric version comes with extension tip panels, bringing the total span to 98". Slope lovers, you must fly it to believe it. Up to 1 lb. ballast magazine available inside main wingspar.

INVENTEC CORPORATION 215-953-1736
808 David Drive • Trevose, PA 19053



ONLY $125!
Will be $150 after first delivery date.

Mariposa™

The ultimate hand launch glider.

Don't waste your money on guess work. Get a glider designed by professional aeronautical engineers, that will deliver contest winning performance. Mariposa has been designed by a team of engineers, who are avid modelers, using the latest computer techniques combined with extensive flight testing.

Check out all the features illustrated above and you'll see that we can give you a great value for your money. Send $3 (applies towards purchase) for a detailed full color flyer on this fantastic new design.

Production is limited. Full payment will lock in this low price and get you a delivery date. First delivery is projected for 1 Aug '95. You may cancel at any time.

SPECIFICATIONS
Wing Span = 59 in
Wing Area = 328 sq in
Weight = 11 oz approx.
Wing Loading = 4.8 oz/sq ft
Radio = Micro w/V-tail mix

MasterCard VISA

Future Flight, **1256 Prescott Ave., Sunnyvale, CA 94089 408-735-8260 Voice/Fax**