R/C Soaring Digest

February, 1996
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A Publication for the R/C Sailplane Enthusiast!

R/C SOARING DIGEST

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Ben is launching his MAKO at a flying site in Costa Mesa, California. With split second timing, George Siposs caught the plane on film as it hurtled upward, in search of the elusive thermal.

As most of you know, George spent a great deal of time experimenting and writing articles over the years; he cared a great deal about the hobby and enjoyed sharing his findings with other sailplane enthusiasts. For example, his last article, which appeared in the January issue, talked about stress and how it can be avoided. We hope it has given some of you food for thought; perhaps it will save at least one of you from a time consuming repair. Thanks, George!

The photograph on the cover was sent in with a brief note, which was unfortunately the last correspondence we had with George; he passed away on November 21. We shall miss him.

Photo by George Siposs.

BEN CLERX & MAKO

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

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The Soaring Site

Talk About 'ABC'

It's easy as one, two, three... Well, at least, in the case of *RCSD*. What are the 'ABC's' of *RCSD*? The 3 B's for newspapers and magazines of the future, according to many Internet experts, are, "Can you read them in bed, at the breakfast table, and in the bathroom?"

You have probably guessed by now that most of you who have answered the survey to date, both Net experts and non-computer users, are posing those very same questions, and more. That's why we have changed the 3 B's to 'ABC', which now includes, "airplane, bathtub, and car".

So, for those of you who have expressed concern, you can start humming along to the tune which we're sure that most of you recognize by now. For those of you that don't recognize the tune, this all means that we'll continue to provide a printed copy of *RCSD* which will continue to be mailed via "snail mail". In other words, no change for the foreseeable future. *(No, we don't have a crystal ball.)*

However, there are many suggestions and recommendations in your responses, the longest being 4 1/2 typed pages long, which will take us a bit longer to sort through and think about, such as getting an e-mail address. Today, we spend considerable time writing letters, sending notes, processing requests for information and all the day to day things that you probably don't want to be bored with. While some of the notes and stuff can be e-mailed, much can't, particularly if there are things like photos. So, the postal & other carrier (such as UPS) mail probably won't decrease much if at all. Yes, we would like to get an e-mail address, but for now, there are far too many issues that need to be worked out before we do. In the meanwhile, thanks for the input and support, and we'll keep you posted.

Happy Flying!
Jerry & Judy Slates

THE INTERNATIONAL VINTAGE SAILPLANE MEET

IVSM - 95

Elmira - "The Soaring Capital of America"

...photos by
John Derstine
Gillett, Pennsylvania
Steve Savoie
Gorham, Maine
Robin Lehman
New York City, New York

MINIMOA

RAGC - JOHN DERSTINE & SON, MICHAEL

BABY BOWLUS

SCHWEIZER I-34, RAD PAINT, CLUB PLANE!

GOEVIER, "2 PLACE MINIMOA".
FROM GERMANY

PRATT READ TRAINER

MINIMOA

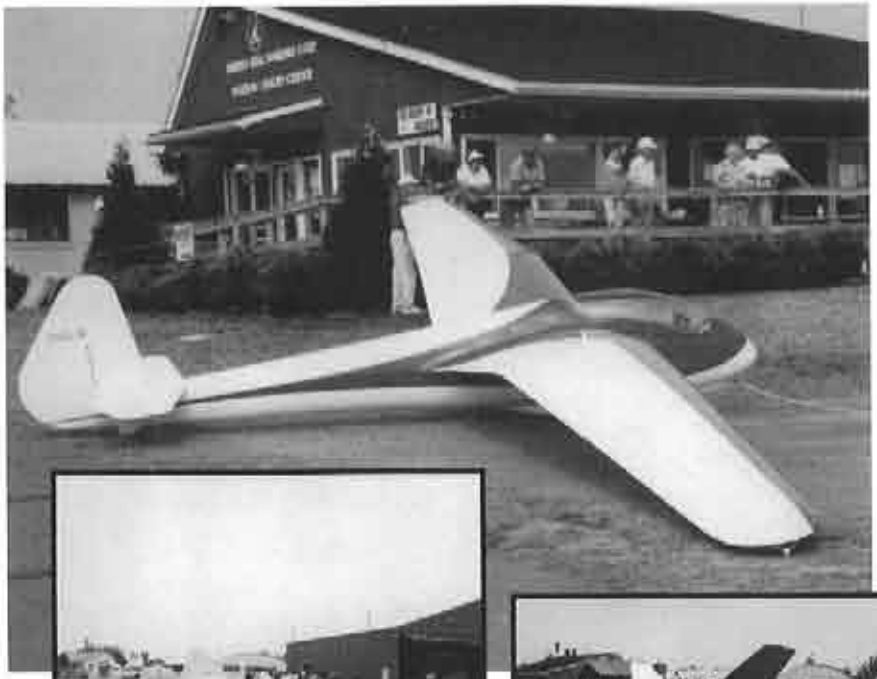
GOEVIER W/GOEVIER PLAQUE

FROM ITALY

VIKING

THE TOWPLANE

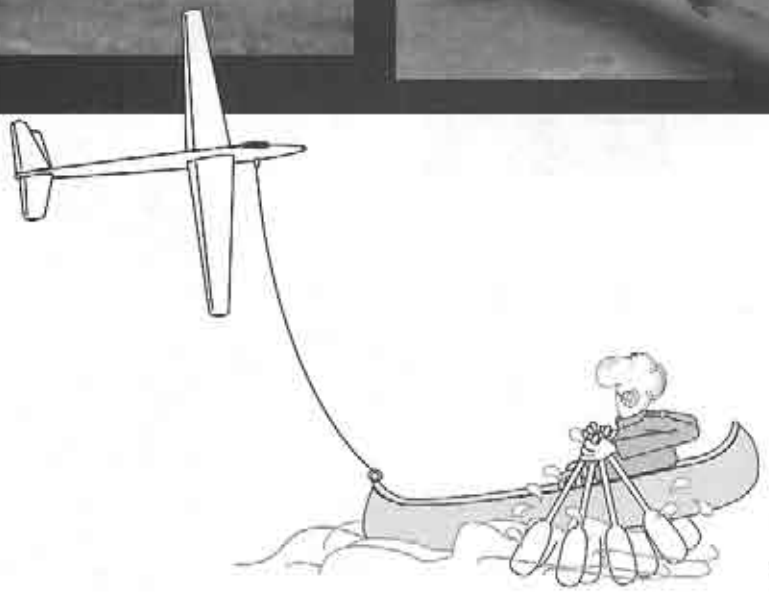
KRANICH PRE-WAR
GERMAN TRAINER




AD
N771A

The IVSM was held at the "Soaring Capital of America" on July 16 - 25 in Elmira, New York. It was the first meet ever to be held in the U.S.A. The R/C Aerotow Demonstration was detailed in the December issue of *RCSD*.

John, Steve, and Robin were kind enough to send us all the beautiful photos you see here. In addition to the photos, we also received a copy of the IVSM Program. The Forward of the Program was written by Jim Swinnich from the National Soaring Museum, and he said, "It is a historic occasion, on a historic site, featuring historic aircraft." ■



In Search of the Twelve Volt Winch - Conversations With the Winch Doctor

...by Douglass Boyd
Estacada, Oregon

Long, long ago, even before the Bird of Time, I journeyed to an LSF contest in Southern California. It was a big contest with nearly seventy entrants. It also had something new and exciting: winches! Now, I had heard about these things before, seen pictures of gas powered ones, and even electric powered winches.

At the pilot's meeting, we were told about the various tasks, the landing areas and the winches. The CD said something like, "And over on the end is a powerful, twelve volt winch for the really big ones." I thought to myself, "Why would anyone want a winch that reels in the line faster? That's the price you pay for having a really heavy ship. Besides, anything over 10 oz./ft. won't thermal... Right?"

Sure enough, throughout the contest, only a few souls ventured over to the dreaded, twelve volt winch. Some were novices who didn't know better... "KER-WACK! Fold those wings!" The others were guys with the big twelve footers who fearlessly strutted up to the line like a Texan in a tall hat, with Super Monokote on his beautiful, see-through wings.

OK. Enough day dreaming; back to nowadays. I asked the Winch Doctor, "What the heck is a twelve volt winch, anyway?"

"Well Billy," he replied, "A twelve volt winch is a winch that runs on twelve volts."

"But they all run on twelve volts, and my name's not Billy," I responded.

"Not so, Timmy," he continued. "Long ago, before the Bird of Time, most winches ran on six volts." Suddenly a bright light went on over my head, and I had the answer to my question; I also realized that the Winch Doctor would probably never call me by my real name.

The next thing that I did was to get a whole bunch of winch motors and take them all apart. Boy, were they dirty! And, much to my surprise, some had different insides. Some had two big field coils and one smaller one. Some just had the two, but they had thicker windings on them. Do these different field coils have different effects upon a winch drum, and hence a further effect upon an upward bound sailplane? I looked up, and there was that twelve volt light, again. So, I asked the Winch Doctor if he would enlighten me as to what these different field coils meant.

He said, "Only when you're ready will I tell you."

"But, Master, when will I be ready?" I asked, kissing up as best I could.

"Just teasing, Tommy. Pull up a chair and I'll tell you."

"First of all, if you have three coils, 2 regular and one small, you have a twelve volt coil (P.N. ST210)."

"Then, that's good, right?" I asked.

"It's OK, but that little coil is called a SHUNT coil, and its job is to keep the motor from running too darn fast! But, we want the motor to run too darn fast, so you can clip the leads running to that little coil, and you'll get more RPM. Next, we have the ones with just two coils; they obviously don't have a shunt at all. And lastly, we see these babies, here."

He held up a set of coils with windings that appeared to be about twice as thick as the other ones. "These are six volt coils (P.N. ST20)..."

"And they got wimpy, right?" I butted in.

The old Doc just glared at me the same way he did when I forgot to wind his stopwatch for his two hour LSF thermal flight. And said, "If you run twelve volts through these six volt coils, you'll get lots of magnetic force, and hence, more RPM! ...Also, more heat, shorter coil life, higher current drain, etc., etc., etc." The old Winch Doctor's eyes began to fade into the distance as he chanted, "Ohm-Volt-Watt-Amp..."

I quietly returned home with my new knowledge of starter motors.

In conclusion, this is what I have discovered. Possibly the best off-the-shelf motor you can buy is the "six volt motor", which is sometimes referred to

as #3112. If you desire even more power, you can install the four coil, six volt set (P.N. ST18), which was originally intended for a Ford Model 'A'. You will have to cut down the coil shoes (those things that hold the coils in the starter body), and re-time the brushes. But, what price power?

Later, I returned to the winch doctor's hut, a ramshackle thing built of broken wing spars tied together with braided winch line. After I knocked on the door, his face appeared at the monokote window.

"Well, hello. What brings you here, Barry?"

I asked the Winch Doctor, "Now that we have lots of power from field coils, what can we do to transfer more of it to the towhook?"

"An excellent question, Barney. Do you remember when you took apart all those winch motors?"

I showed him my hands, which were still dirty from carbon and copper dust.

"Good," he said. "Remember the front plates on those motors? They all have a big cast boss in the center that limits the axial movement of the armature."

"Sure, I remember. The top of the casting was the only clean part inside those motors. How come?" I asked.

I could tell the Doc was about to reveal some great truth to me at this time, so I tried to pay attention.

"Whenever you energize the field coils, the armature wants to shoot out the end of the motor case. Since it can't do that, it rotates, instead. What keeps it inside the case is the cast boss that was so shiny."

"You mean it rubs against the armature?" That twelve volt light above my head must have lit up, again. I asked, "Doesn't that make a lot of FRICTION?"

"Yes, Grasshopper," he said, "Despite inhaling all those CA fumes, you have a few working brain cells left."

I took my brain cells and went home to exercise them.

I replaced the bushings with ball bearings and added a spacer to apply the linear thrust load against the front bearing inner race. I was amazed how freely everything turned when I re-assembled my winch. My winch had bronze bushings, and the motor would tach at 4,000 - 4100 RPM with no extra load on it, just the drum full of line. With the ball bearings installed, I pointed the optical tachometer at the stripe of black tape on the drum, and stepped on the pedal. I was shocked. The tach read 5500 RPM. A 1/3 increase in RPM! How this free RPM increase affects actual launch performance is hard to say, but I'm sure my motor will last longer and run cooler than before.

I wound up making a few sets of ball bearing endplates to fit the ford long shaft starter motor just for a few friends and club members. It snowballed into a major project, and I have built and shipped over 100 sets under the name "Real Balls". But, that's another story...

You can get the items mentioned in this article at the following addresses:

starter motors, field coils, installation
(Ace Electrical source)
Faulkner Automotive Electric Co.
1831 NW 28th Ave.
P.O. Box 10092
Portland, OR 97210

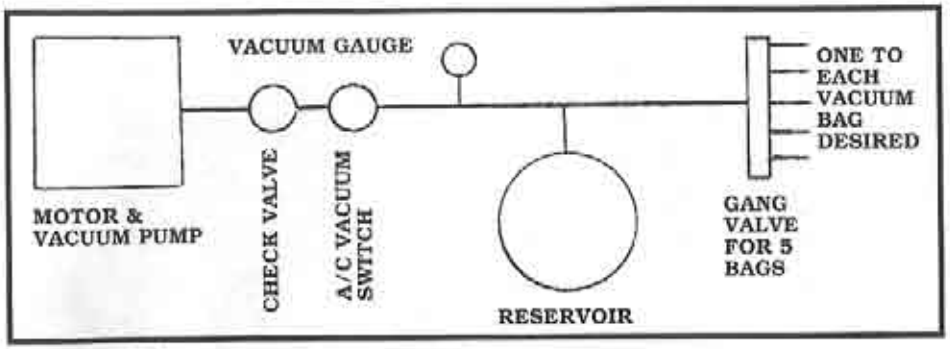
ball bearing endplates - Ford starter motors
(Real Balls)
Douglass Boyd
29918 SE Davis Rd.
Estacada, OR 97023
(503) 630-3515 or (503) 630-4451

■

Parts List
(Available from Ace Electrical)

Coils only
st210 12v (with shunt) - windings are .032 thick
st20 6v (no shunt) - thicker windings
st212 12v (4 coils)
st18 6v (4 coils) - must modify coil shoes and change timing

Complete Motors
#3115 standard 12 volt motor, usually used for retrievers
#3112 6 volt motor (no shunt), best choice for winches, run it on 12v!
#3136 4 coils, 12 volt motor, end plates do not interchange with others



Jer's Workbench

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

Making a Vacuum Pump

Last month, I shared a few techniques used to vacuum bag a set of wings for one of my latest models. Having done very little vacuum bagging, I decided to do another set of wings and stabilizers. This month, I'll explain what I did. For those of you that vacuum bag your own wings, this is probably going to be old hat; for those of you that haven't done any vacuum bagging, but have wanted to, maybe this will help you get started.

There are many items that are required. I don't recommend taking any short cuts; it is not worth the time and money that it can cost you if the short cut doesn't work!

I built my own personal vacuum pump set-up, which is the topic of the column this month, but there are several good, commercial set-ups that can be bought over the counter, today. Both Aerospace Composite Products and Composite Structures Technology carry vacuum pumps and vacuum bagging supplies.

First, where does one find a vacuum pump? A good industrial tool, pump supply, or a medical supply business would be the place to start. Of course, if you are lucky enough to have a good, used, surplus tool supply in your area you may get lucky and find a motor, vacuum pump, vacuum gauge, and an A/C vacuum switch, which is where I found mine. The reservoir tank is an old freon bottle, which I obtained from an air conditioning repairman. The check valve, tubing, T-fittings and gang valve were purchased at a local pet store. Sound odd? Well, these are used in aquariums, and were exactly what I needed!

Are you wondering, "What's with the check valve?" Well, I didn't want a continuous running pump. The check valve sucks the air out of the bag and, because it's one way, the air doesn't go back into the bag.

The A/C switch is used to adjust how much vacuum should be pulled. At present, it's adjusted to pull a maximum of 14 lbs. per square inch, and a minimum of 9 lbs. per square inch. Once the bag is sealed, then the pump is turned on. Using a large bag, it takes about 30 seconds to draw all the air out of the system; then the pump shuts off. If the bag has few or no leaks, the pump will not come back on for over 2 hours, which is about when the vacuum drops to 9 lbs. per square inch. Then, the pump will only run for about 5 or 6 seconds and shut off again when it reaches the 14 lbs. per square inch maximum.

The reservoir is used to add volume to the bag. This way, the pump doesn't have to turn off and on so many times. The gang valve allows me to use more than one bag. If you purchase from a pet store, I recommend purchasing several feet of tubing and several T-fittings so that everything can be hooked together.

Unfortunately, this system is installed inside of a roll-around cart, so a photo was out of the question. The diagram shows how all the components were attached together.

I recommend that the vacuum bag material be purchased from a supplier; we don't want bags that leak, 'cause it makes us very unhappy! So, use the best bagging material available. As far as I know, there are not any ready made vacuum bags, so you'll have to custom make your own. One method is to use a nylon film or nylon tube, along with a good sealant tape and bag clip.

Next month, I'll go into detail on making a vacuum bag.

Aerospace Composite Products
14210 Doolittle Dr.
San Leandro, CA 94577
(800) 811-2009

Composite Structures Technology
P.O. Box 642
Tehachapi, CA 93581-0642
(800) 338-1278

■

SOAR NATS

1996

Model Aeronautics Association of Canada

CANADIAN R/C SOARING NATIONALS
JULY 16 - 21, 1996 OTTAWA, ONTARIO

2 Metre - July 19 Standard - July 20 Open - July 21
Thermal duration / graduated spot landing
awards to 3rd place / Grand Champion / Best Overall Junior
Entry fee $10.00 per class $7.00 for Juniors

F3J - July 18
Entry fee $10.00 $7.00 for Juniors
awards to 3rd place - 2 frequencies required

Canadian X/C Championships - July 16-17
Entry fee $25.00 per team
Preregistration by 15th June 1996 is mandatory for X/C and F3J

Flying site is located at Petersen's Turf Farm - Osgoode Ontario
For information and registration form write to:

SOAR NATS 96
18C Arnold Dr.
Nepean, Ontario, Canada
K1A 0K2

The Fall Soaring Festival has a little of everything, including a live band to serenade you while you feast on the barbecue. This is truly a "class act".

Just another "cotton picking" pilot coming out of the infamous cotton fields that surround the Central Valley R/C Soaring Club (CVRC) field.

Another Look - Visalia '95

...by Ron Scharck
La Jolla, California

Each year, the CVRC donates a portion of the contest proceeds to a charitable foundation; another factor that makes this yearly event so outstanding. The CVRC Contest Director is presenting a check for $1000 to a representative from a charitable foundation.

Tim Renaud opens the first round of the contest. Steve George, Keith Kendrick, and Chris George give Tim instructions.

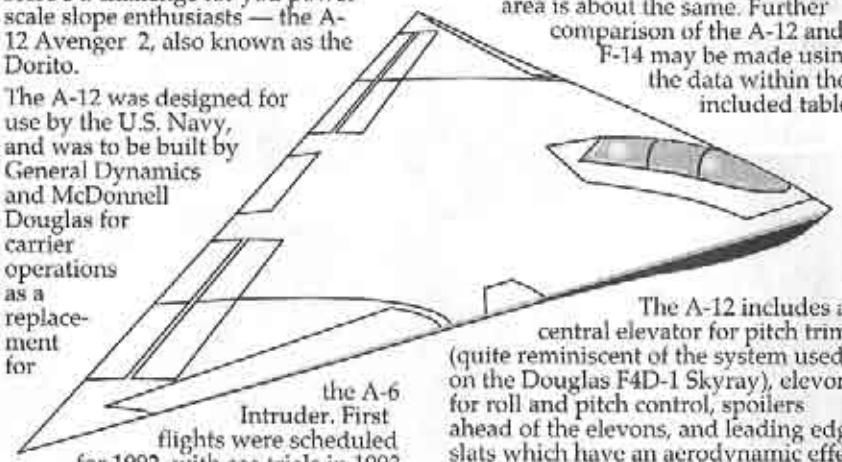
on the Wing

P.O. Box 975
Olalla, Washington
98359-0975
E-mail: bsquared@halcyon.com

The A-12 Avenger 2/Dorito, another PSS candidate?

Here's a challenge for you power scale slope enthusiasts — the A-12 Avenger 2, also known as the Dorito.

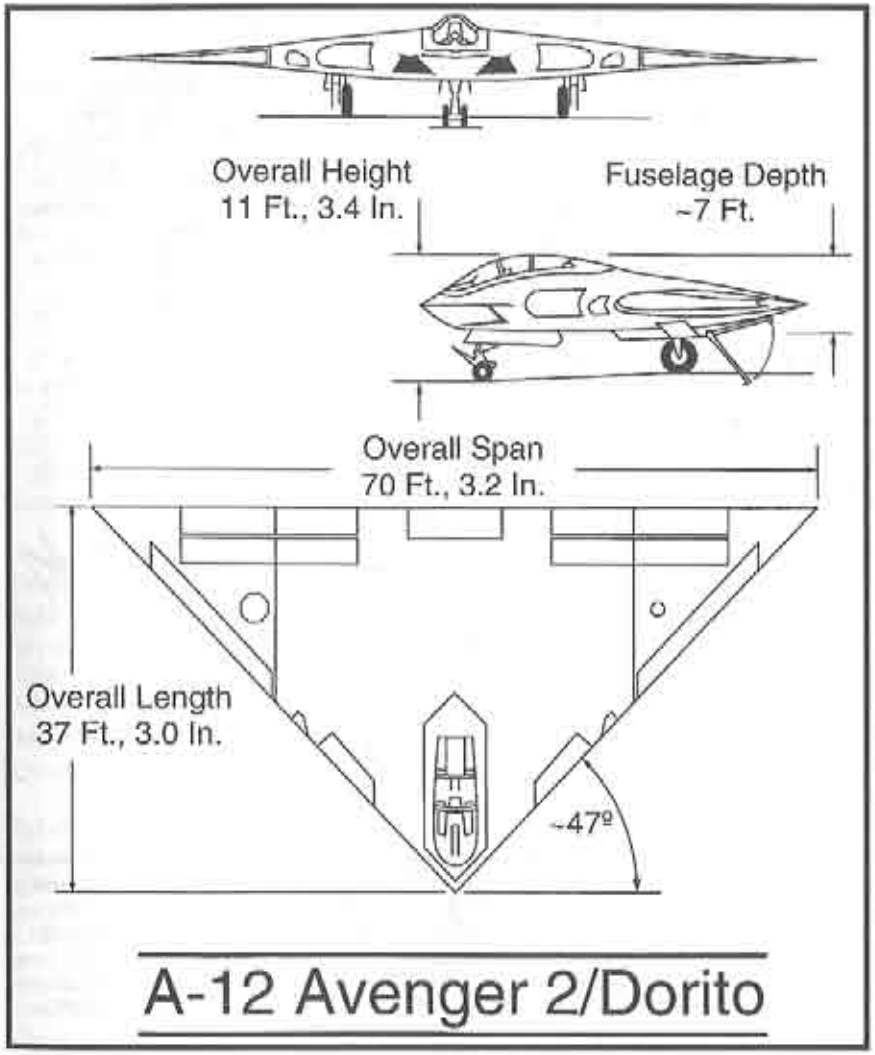
The A-12 was designed for use by the U.S. Navy, and was to be built by General Dynamics and McDonnell Douglas for carrier operations as a replacement for the A-6 Intruder. First flights were scheduled for 1992, with sea trials in 1993, crew training in 1994, and entry into operational status in 1995. According to initial plans, 858 aircraft were to be built. The entire project was cancelled in 1991, however, for economic reasons.



The A-12 is a true delta wing, and therefore has a relatively low aspect ratio. A light wing loading was expected to be mandatory for good landing characteristics. To give some idea as to how this translated into the actual aircraft, it should be noted the A-12, although about 20% heavier than the F-14A Tomcat, has more than double the wing area, while wetted area is about the same. Further comparison of the A-12 and F-14 may be made using the data within the included table.

The A-12 includes a central elevator for pitch trim (quite reminiscent of the system used on the Douglas F4D-1 Skyray), elevons for roll and pitch control, spoilers ahead of the elevons, and leading edge slats which have an aerodynamic effect over about a quarter of the wing area.

Dimension	A-12 Avenger 2/Dorito	F-14A Tomcat
span	70' 3.2"	64' 1.5" max. 38' 2.5" min.
length	37' 3.0"	61' 11.75"
height, ground to top of canopy	11' 3.4"	12'
fuselage thickness	~7'	~7'
aspect ratio, wing	3.75	7.2 max. 2.58 min.
wing area	1,308 ft^2	565 ft^2
gross weight	80,000 lbs.	66,200 lbs.
wing loading	61 lbs./ft^2	117 lbs./ft^2
design load factor	9g	
program status	cancelled 1991	~900 in service



The A-12 has no vertical surface. Elevons alone should provide sufficient pitch and roll authority for a model, but some fin area may be necessary for directional stability, as the forward portion of the fuselage is relatively deep.

We're eager to hear from any readers who tackle this project.

Information for this column was derived from:

—, "Stealthy Avenger." *Popular Mechanics*, November 1990.

Angelucci, Enzo, and Peter Bowers. The *American Fighter*. Orion Books, New York, 1985.

Berliner, Don. "Dorito." *Model Aviation*, April 1991.

Morrocco, John D. "Funding Cuts May Limit Carrier Air Wings to 16 A-12s." *Aviation Week & Space Technology*, 01 October 1990.

Renshaw, Kevin. "A-12 Avenger Stealth Fighter." *TWITT Newsletter* #113, November 1995.

■

Pull Power

...by Robin Lehman
New York, New York

I've spoken to quite a few people recently who are building new towplanes this winter. What follows might be helpful in determining what motor might best suit your towplane.

In the past few years, a lot of new motors have come onto the market, and by looking at the specifications of these various motors, it has become clear that many manufacturers and distributors have no real idea of what pulling power a given motor really has.

When asked how many pounds of static thrust a motor has, I either get an outrageously exaggerated figure or, more often than not, no answer at all. Most of the people who make and sell these motors just don't know!

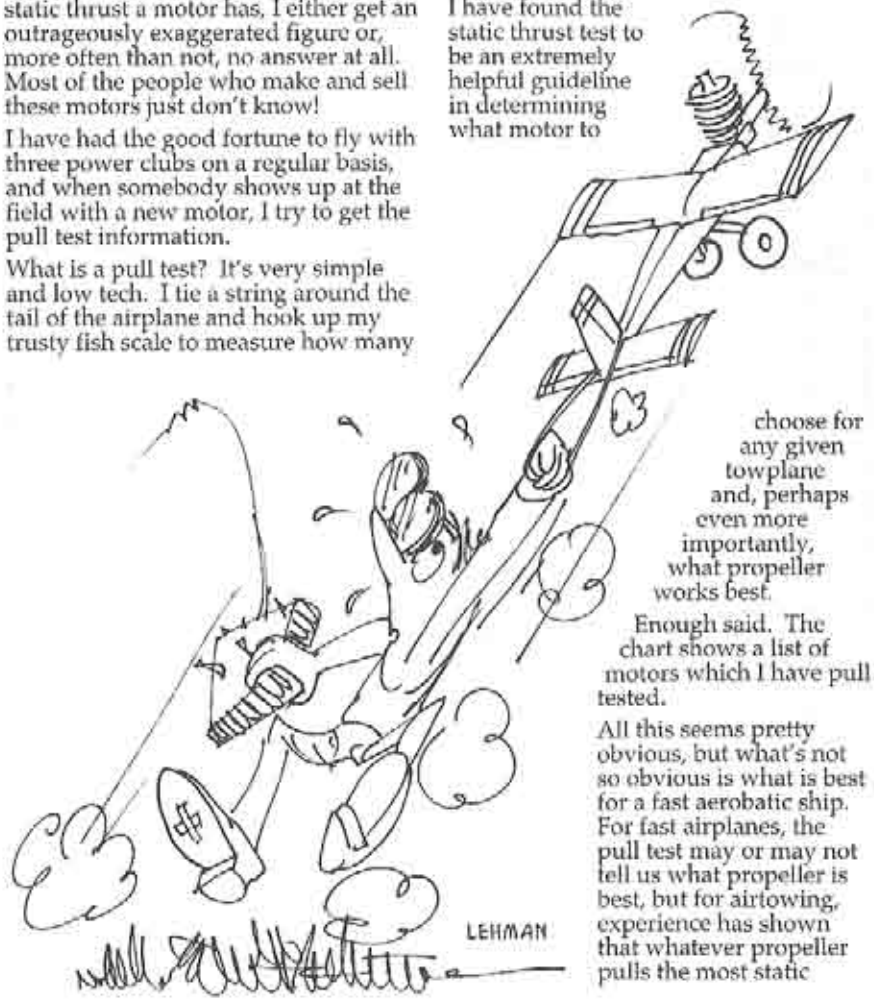
I have had the good fortune to fly with three power clubs on a regular basis, and when somebody shows up at the field with a new motor, I try to get the pull test information.

What is a pull test? It's very simple and low tech. I tie a string around the tail of the airplane and hook up my trusty fish scale to measure how many pounds the motor will pull at full throttle.

The accuracy of this test has been borne out on a day to day basis. Once in awhile, we have had to change props (Yes, we do have the occasional bad landing I'm sorry to say.), and did not have a replacement prop with the maximum pull power (as per our test). Guess what? On our next tows, pulling the very same sailplanes, our trusty tug did a little less well.

Now it's true that the old fish scale test may not quite give you the best performance for a fast flying stunt plane, but it is 100% reliable when it comes to towplanes.

I have found the static thrust test to be an extremely helpful guideline in determining what motor to choose for any given towplane and, perhaps even more importantly, what propeller works best.



Enough said. The chart shows a list of motors which I have pull tested.

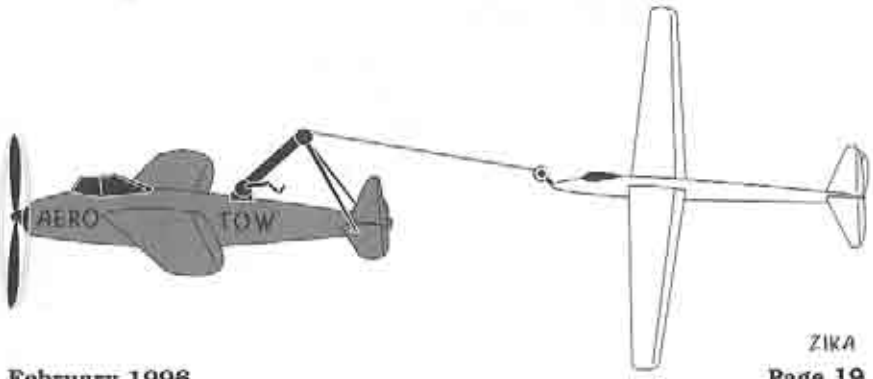
All this seems pretty obvious, but what's not so obvious is what is best for a fast aerobatic ship. For fast airplanes, the pull test may or may not tell us what propeller is best, but for airtowing, experience has shown that whatever propeller pulls the most static thrust, pulls best on tow. The difference between the best propeller and another can be quite dramatic. ***If you put the wrong propeller on a motor, you can lose a huge amount of pulling power.***

Motor	Prop Size	Thrust	Towplanes	Weight
O.S.F.S. 120 (glow)	14 x 8 Zinger =	12 lbs.		
O.S. 108 (glow)	15 x 8 APC=	14 lbs.	Senior Telemaster	12 lbs.
O.S. 160 F.S. Twin (glow)	16 x 7 APC =	15 lbs.	Senior Telemaster 1/4 Piper Cub	12 lbs. 13 lbs.
Saito 300 F.S. Radial (glow)	20 x 8 Zinger =	18 lbs.		
Zenoah G-38 (gas)	20 x 8 Zinger =	18 lbs.	1/4 Clipped Wing Cub	14 lbs.
O.S. BGX-1 (glow)	20 x 8 Zinger =	19 lbs.		
Brison 2.4 (gas)	18 x 10 ? =	20 lbs.		
O.S. 320 F.S. Radial (glow)	20 x 6 Zinger =	20 lbs.		
Saito 300 F.S. Twin (glow)	20 x 10 Zinger =	24 lbs.	Large Stinger	16 lbs.
O.S. 300 F.S. Twin (glow)	20 x 10 Zinger =	24 lbs.	1/3 Lazer Large Stinger	18 lbs. 16 lbs.
Zenoah G-62 (gas)	22 x 8 Zinger =	25 lbs.	Modified Robin 99 Yak 112 1/3 Flybaby Biplane	22 lbs. 22 lbs. 24 lbs.
Brison 3.2 (gas)	????? =	26 lbs.		
Saks 4.2 (gas)	24 x 12 ? =	26 lbs.		
3W 80 In-line Twin (gas)	24 x 12 Zinger =	30 lbs.		
3W 80 Twin (gas)	24 x 10 Zinger =	36 lbs.		
Saks 8.4 Twin (gas)	24 x 14 Clark =	37 lbs.	1/3 L-5	36 lbs.
Quadra 100 (gas)	24 x 14 Zinger =	37 lbs.	Enlarged Modified Robin 99	25 lbs.
Brison 5.8 (gas)	24 x 8 ? =	40 lbs.		

Obviously, the list of motors is by no means comprehensive. More and more motors are becoming available, and one of these might be perfect for your towplane.

So, if you decide to use a motor which is not on this list, well, go find a friend who likes fishing and borrow his scale!

Good luck! ■



THREE PEAS IN A POD

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Paul Ikona
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Covina, CA 91722
(818) 966-7915

PSS Monthly Honors F3B Team

Pasadena Soaring Society's President, Paul Trist, Jr. recently invited us SOARHEADS to join in a victory celebration for first place United States '95 pilots Perkins, Spencer, and Wurts (Team Manager Jolly and assistants Layne & Renaud), during their September monthly.

The flying field is a park just adjacent to the Rose Bowl Stadium, bottle-necked in a valley surrounded by residentially-populated hills. Although the air at times was somewhat difficult due to the terraced terrain, most of the boomers appeared to kick off downwind and bunch up against the uneven hillside. Making time from that part of the sky was a piece of cake. Following the contest, PSS hosted a lavish spread featuring 60 lbs. of BBQ tri-tip and all the fixings. (Wurts ate fish!) We had a great time and really appreciated the invitation!

Final scores were: B.J. Weisman (2992), R. Spencer (2989), and D. Perkins (2986). (They all had the meat!)

Incidentally, this was a great format and really encouraged some creative flying. Us SOARHEADS from California Soaring Products highly recommend other clubs take a swing at a similar contest. We guarantee that it will provide most pilots with at least 30 minutes of fun and challenging competition. Here's the scoop. See what you think!

Contest Format

Three rounds, 10 minutes each, scored 900 points, 1.5 points per second. Landings, standard 25 ft. tapes, scored 100 points. Sound easy? Well, here's the hook.

1. Before you can score any landing points, you must fly 10 minutes. (I.E., fly your 10 minutes, then set up and land.)

2. If you do not get 10 minutes, you can only get flight points.

3. Because you don't have to fly precision time, you do not have to use a timer. This will allow maximum fliers at all times. Just set your watch for 10 minutes, and fly until the beeper goes off. Then land.

4. There will be no flight order. You can have a maximum of 5 launches. If you don't think you can get 10 minutes, you can land and try again.

5. If you get your three tens, but did not do well on your landing, you can throw out one 10 minute round. You must tell the score keeper which round you want to throw out.

That's it!

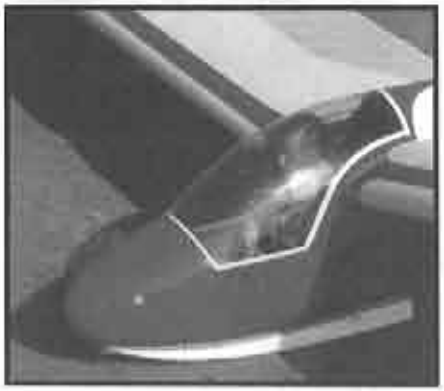
World Champs at Pasadena F3B Welcome Home.

Joe Wurts at Pasadena F3B Welcome Home.

Second Annual Winter Scale Soaring Festival

Curt: After a hearty breakfast, the "Three Peas" and fellow Soar Head, Ron Adams, arrived at a socked-in SULA (Soaring Union of Los Angeles) flying field on the campus of Cal State Dominguez Hills. This site is located just adjacent to the famed Veladrome which is best known for hosting the Olympic bicycle races.

If you remember reading about this event last year (*RCSD*, Vol. 12, #6, p10) the very first scale Soaring Festival was a two-day contest held at the Empire Polo Club in Indio, California, overseen by DUST (Desert Union of Soaring Thermalists) and club president Buzz "Big Birdy" Waltz. Once again, Buzz, in association with DUST, organized and sponsored this second annual competition featuring vintage scale, modern scale and stand-off scale, but any type of sailplane model could be flown during non-scale events. Although only approximately twenty pilots participated, there were a multitude of models on static display (a few for sale), and a large contingent of interested spectators including some highly respected thermal duration pilots with planes already on order and biting at the bit to cross-over to the new challenges of scale competition thermal soaring. Roger Lackey ('94 Visalia winner) made an appearance with his wife, and Ben Clerx (Mako designer and former Visalia champion) were seen videoing some of the action. Merrill Brady (M&M Glider Tech) and wife stopped-by. Mike Aquirre (Team Funk) is also said to be testing the waters while rumor has it that world class pilot Larry Jolly is preparing to take the leap. Pete Olsen (Masters



of Soaring C/D) was spotted carrying literature on a 1/4 scale Discus. Other notables such as Dennis Brandt (last year's longest flight money winner), Rick Briggs (Harbor Soaring Society), Randy Spencer (F3B Team) and Stan Sadorf (Team Funk) are already competing. Art Markiewitz flew an RnR XC ship for fun, but I expect to see him jumping on board in the near future. 1995 Rose Bowl winner Mike Reagan and I were doing some friendly bantering over a 1/3 scale Nimbus with Sailplanes Unlimited's Robin Lehman; most of us already know that Mike has been flight-testing a model for production of an affordable full-scale kit. Details on that in a future column. I've also had several conversations with Dennis Brandt and ardent scale supporter Mark Foster regarding an appropriate intro-level 1/4 scale model for myself. We also had interesting discussions concerning the development of an organized Southern California association dedicated primarily to flatland thermal competition with an emphasis on altitude tasks, landings and scale maneuvers. Although the slope has long been the scale enthusiast's stomping ground, it certainly appears that some serious contest flying will soon be making its way inland to the winches. Of course,

that's not to say that a monthly contest calendar couldn't include a mix of slope events. I had a lengthy and pleasant conversation in the pits with a very cooperative Gary Fogel who many may remember for flying a scale ship at the '93 Visalia contest. Gary openly admits scoring better that year than he did last October with his Falcon 880. When asked if he'd do it again, Gary paused for a moment then said, "Maybe next year....with a brake!" I'd sure like to see it!

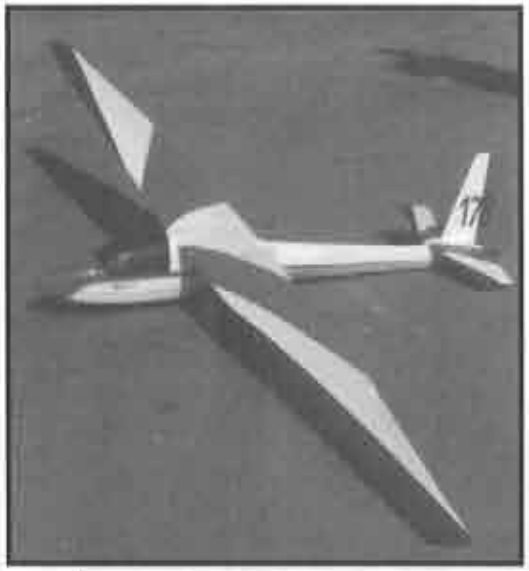
Close to 10 o'clock, the fog began to lift. As the sun burned through the haze, a Good Year blimp lifted off from its local landing pad. Shortly after, a pilot's meeting was called. There seemed to be a certain carnival-like atmosphere to this event. A hot-air balloon was gradually being filled with intermittent blasts from across the field while spectators wandered around the pits asking questions or gathered around the three full-scale gliders that were kindly trailered-in for display. The tug pilot was heard running-up his engine on a dirt strip. Many just stood in line at the well-stocked concession stand for their morning's first cup of coffee. A representative from the VSA (Vintage Sailplane Association) offered their continuing support and Bob Banka hawked an extremely comprehensive manual of data on scale documentation. I had a chance to chat with Phil Bernhardt and Bill Forrey (*Model Builder*) while they made the

rounds, and also caught-up with Don Edberg (*RCM*) and columnist Pete Young (*R/C Report*) to try to get their slant on what might be the next model soaring epidemic, but they weren't talking.... Probably something about being out-scooped! Seriously though, these are a bunch of great guys that are really dedicated to furthering this sport; so try to make a point of catching their next column.

Aside from the press (Three Peas included), Rahm winches were there in force, Sailplanes Unlimited offered nicely prepared (free) brochures with photographs, and a rep from Hobby Club stayed pretty busy answering numerous inquires about their nifty pint-sized Lunak, Pilatus and ASW-19 stand-off scale slope machines from the Czech Republic. Paul and I continued to interview and scribble while Mike did some great work shooting pictures. Ron ably manned the Soar Head video cam.

The contest, basically comprised of multi-attempts at the longest flight (cash prize) and landing points, was about to get underway as the contestants carried (and in some cases, rolled) their sailplanes into position at the winches. After launching, the pilots would be required to navigate the crowd and walk through an airstrip designated for the tug, in order to arrive at a well-groomed grassy landing area. A bit of poor planning, but not impossible to negotiate. Four twenty foot landing zones marked with a yellow centerline and measured from 1" to 40" with a PVC pole awaited the pilot's arrival. Most appeared to use a 30' roll-out on the dirt before reaching the grass. Throughout the day, planes seemed to be landing all over the field, apparently unable to make it back to the designated landing area. We also found gliders thermaling over the winch lines a bit disturbing. Dennis Brandt showed me his direct-drive braking system that engages a stan dard servo (no servo-saver) at the bottom-travel of his Vision's spoiler stick, and activates an extremely effective shoe-type friction brake. Anybody want to burn some rubber?!?! It works great. Others frequently overshot their landings and were forced to take what some were calling the "walk of shame".

But the primary reason we came to this event was due to our fascination with the scale sailplane, the 1-26, the Pilatus



B-4, glass slippers like the ASW 24's, the 27's, DG 600's, the Grob or the tasteful vintage styling of a classic Minimoa, sleek gull-winged Pheiners or the famous SG-38 "school glider". There's something intriguing about flying a model sailplane that looks like the real thing. I personally find the scale-like wing flex quite appealing, and the aesthetics of a retractable gear on such an efficient airframe make my imagination wander. The project possibilities are endless, but kit availability sure isn't. This problem is further compounded by cost. The average 1/4 and 1/5 scale wood "builder's" kit will usually start at about $350, while 1/3 and 1/4 scale modern sailplane kits range from $500 to $2000 or more. The word I got this weekend is that the 1/4 scale ASK 21, offered by Sailplanes Unlimited, is the best buy around, bar none. It's been advertised in *RCSD* and recently appeared on page 150 of the Jan. '96 *Model Aviation* magazine. Ron Wahl also did a review on this model in the Sept. '95 issued of *RCSD* (p38). Another viable alternative to curbing some of the expense is to order one of Jerry Slates' pristine fuselages from Viking Models, a set of glass-bagged wings, stabs and rudder from Ben Matsumoto and a slick retract from Bill Liscomb. Or, just call my boss (#1 Soar Head) Paul Ikona at California Soaring Products (818) 966-7215 and he'll arrange everything. Is that a plug, or what??

Some of the sailplanes on hand this weekend included Randy Spencer's smooth-flying 1/4 scale Wortman-winged Multiplex DG 300, a beautiful Roke 4.1 balsa-sheeted ASK 18, the Rogel's 1/4 scale Thermoflügel DG 600 and 1/5 scale Multiplex DG 600, a 54 lb. 1/2 scale Grob Twin Astir (some things are just too big!) and Mark Foster's 11 year old T22 based on a W.W. II trainer originally hangered in Twenty-Nine Palms, California. Mark says it's 100% scale, has a flat-bottomed airfoil, and was scratch built

from *Model Aviation News* plans.

On a sad note, I had a chance to talk with easy-going Gene Serrano at his van as he disassembled the remains of an ill-fated 1/5 scale Thermoflügel ASH 26 before a long drive home to San Diego. What at first appeared to be a tip stall on launch and at low altitude, may actually have been a run-in with a nasty retriever line. Gene mentioned that the model was set-up primarily for slope flying and really wasn't sure what to expect when he stepped on the pedal. One wing was severely damaged and the fuselage was cracked or torn in several places. Looking at Gene's model, I couldn't help but wonder if the towhook location was actually the real culprit. There didn't seem to be any rigid rule among the flyers. Some hooks were placed in front of the wheel, some appeared to be even with the wheel's axle, and several were well behind the CG. The same thing applied to the retract in the down position. Most of the axles were fairly even with the LE of the wing, while others of the same model-type and manufacturer were nowhere close to that. Then, some just didn't bother with a retract at all.

Aero-tows were impressive, interesting to observe and scale-like, but few pilots improved on what they would have achieved from a well executed winch launch. Time after time we watched a very talented tug pilot pull a glider right into the core of a thermal and make a clean release only to see the sailplane pilot fly out of it and into sink. The wing tips and tail would kick-up two or three times during numerous descents from at least 500 feet. Moments later, a lot of these guys were on final approach as we stood there scratching our Soar Head scalps. I have to believe, that although most of the pilots I talked with are exceptionally competent and highly-qualified slope flyers, most seldom have the opportunity or maybe even the desire to do much in the way of flatland soaring and thermal hunting. My only criticism of the contest was that it wasn't too difficult to sort-out the thermal duration pilots from the slope pilots. I believe that the previously mentioned Southern California scale

sailplane association will help close the gap.

Mike: I found the aero-tows to be the most interesting part of the flying portion of this contest. The coordination between the tug and sailplane pilots is critical. When done properly, the sailplane can be released in good air, and shouldn't have any problem gaining significant altitude. Some of the tows resulted in early releases, probably as the result poor coordination between the two pilots. I've flown a few times from the back seat of the Grob Twin Astir, and always found the aero-tows to very exciting. The advantage of the tug pilot knowing where he encountered lift during the previous launches and being able to tow the sailplane for a while at altitude, greatly increases your chance of getting off to a great start by being released in a thermal! The properly flown aero-tows were beautiful to watch.

Curt: One last issue: the "all-white" glider. I interviewed several pilots that said they regularly fly at one thousand feet without any difficulty. The problem is, that most of us non-scale guys often thermal at almost three times that altitude. I'm also certain that the scale sailplane would be an efficient XC machine, but some pilots enter the course when they lose sight of the horizontal

stabs in order to make the 10 - 25 mile trek out and back. Most scale enthusiasts want to retain the purity of the model and seem to generally oppose darkening the underside of the wing to ensure visibility. Robin Lehman recently addressed this matter in *RCSD* (Nov. '95, vol. 12, #11, p4) and offered several workable suggestions regarding color, patterns and stripes. There are, of course, other alternatives. One pilot told me that he uses a low-adhesive tape to temporarily add wide diagonal stripes to the bottom of the wing. Others mentioned a similar technique. Apparently it's also easily removed after flying.

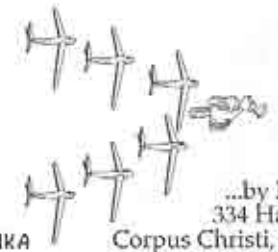
Let's face it, the potential is there. Today's scale models sport Eppler, Wortman and Quabeck airfoils we've seen so effectively used in recent years on our non-scale open class gliders. The cost for an entry-level 1/4 scale ship isn't really out of line with what most of us are already flying, and as we've pointed out, there's ways to defray some of the cost. From what we've been told, they're not really any more difficult to fly than most aileron equipped thermal duration planes. Wouldn't it just be a nice change to fly something that looks like a full size sailplane? We think so.

Thanks to all the folks from DUST and SULA who made this bunch of Soar Heads feel right at home. See you next time!

Until next month..."BOOMERS"!

■

This Old Plane



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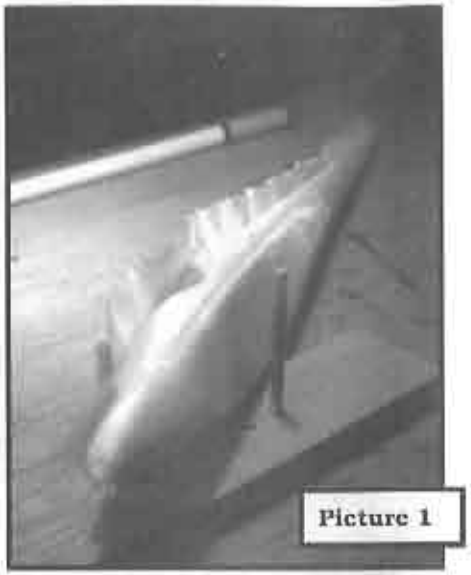
One more way to make a lost foam fuselage.

I hear questions about how to make lost foam fuselages more often than any question, except the one from tourists when flying at our local slope, "Does it have a motor, how much does it cost, and how far can it fly?" I also hear more different answers to this question than any question, except the question about the dive test. We will leave the dive test out of it however, and just try for one method to make a lost foam fuselage.

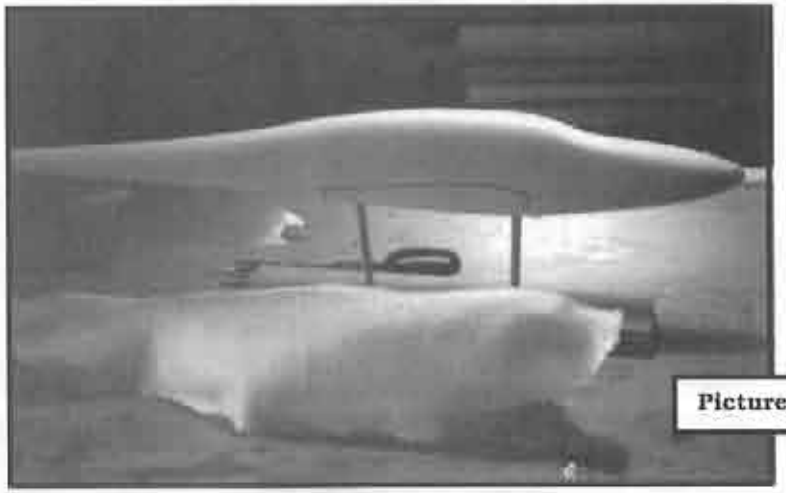
First, why would you want to make one? There are a few reasons. Perhaps, you made the wings already, and don't want to wait on ordering a fuselage. Second, you want a shape that no one makes. Third, you figure $10 spent is better than $40. Realistically though, there are plenty of people out there making fuselages, but in this case, I wanted a Beechcraft Bonanza. But I didn't get one. Now, don't go looking at the pictures and start laughing; it really did start life as a Bonanza, and what you see in the pictures is the result of a decision to go for speed instead of any resemblance whatever to a Bonanza. In fact, the foam was laid out from 3-views printed by the mechanic, at our local air maintenance facility (good source), from the micro fiche they use for part numbers. Then, I changed my mind.

The first step is shaping the foam. That can be the hard or easy part; depends on your eye/hand co-ordination. My method involves gluing two blocks of blue foam together using wood glue,

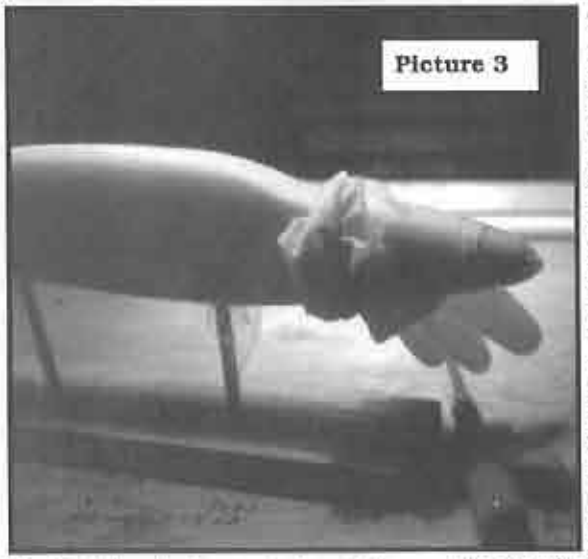


Picture 1

with a piece of paper between them. The paper gives me a good center line to keep things symmetrical. After marking the outline, top and side, a coping, scroll, or band saw makes short work of getting a squared-off, fuse shaped block. Next, see where you can make more lines, and cut the corners at some angle to reduce the sanding, and maintain proper shape. Next, sand off anything that does not look like the plane you want. Start with a perma grit bar, and progress to about 240 grit. By the way, this is where I looked at the Bonanza fuselage and decided I would not be caught dead flying that thing; so, proceeded to whittle about 80 percent of the foam away until it ended up looking like what you see in the pictures. Errrr, call it a VERY PSS'd passenger plane; locally, we just call it ***fast***. Once you have the foam exactly like you want the plane to look, it is time to start the glassing process. Many people, at this stage, do something to prevent the epoxy from going into the foam; for me it depends on the weight goals of the finished plane. For a hand launch, I will use spackling to fill the pores in the foam, and prevent extra weight caused by using epoxy. This being a slope plane, the heck with it. Weight is speed, and only strength matters.



Picture 2



Picture 3

being in a hurry, I decided to do two separate layers to show two different techniques, one per layer. For a HLG pod, I use one layer of 3 oz., and one of .75 oz. to smooth out the surface without filling. For slopers this size, two layers of 4 oz., with extra reinforcement layers where needed, makes a rugged fuselage. For bigger slopers, I have gone up to 14 oz. or more of cloth from behind the wing forward, while trying to keep it lighter towards the tail. I like planes that ***bounce***.

The first step to glassing is to cut the cloth to shape. You will find that different weaves, and amount of sizing in the cloth, allow it to shape better or worse. Working in a mold, I usually like using the "crow foot" weaves, but not for lost foam; it does not maintain its shape like the 4 oz. regular weave is doing in Picture #1. Wrap the fuse, and cut the cloth to shape. Note that it overlaps on the bottom (a sloper remember). Cut all layers, and set them out in order. You can do all layers at once, but in this case, not

Picture #2 shows the foam on a stand; the holes are where the wing bolts will go. The cloth is ready, and has been sprayed with 3M#77. Note carefully the nose of the fuse; there is a small patch of cloth stuck on the front (3M#77). This is because wrapping around the nose is very difficult. Stick the cloth to the foam; it peels off foam easily, but not if it touches itself. So, take care. Once the cloth is layed down to your liking (perfectly smooth), start mixing epoxy. I will not use polyester resin, as the vapors dissolve foam. That is why

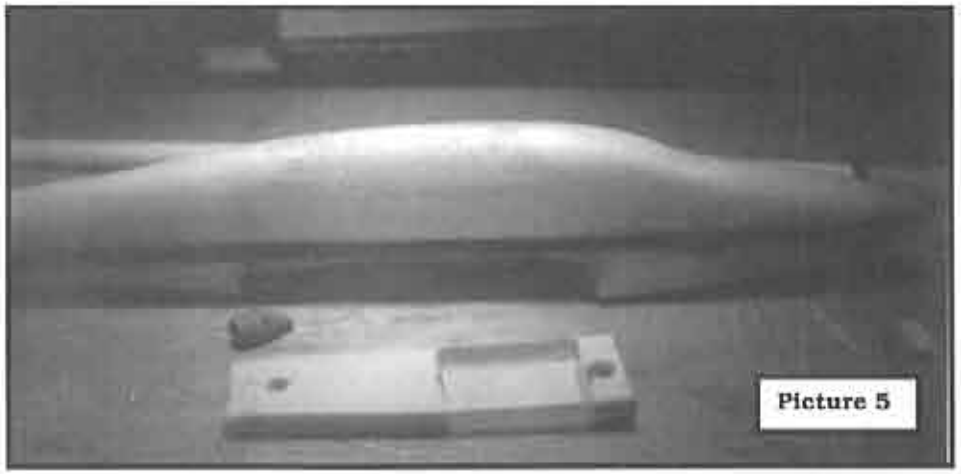
many techniques of lost foam include wrapping the foam in all sorts of protective things. I'd rather use epoxy, as it will not hurt the foam. I think of using polyester resin the same as jumping off a cliff cause you MIGHT not die. Use laminating epoxy, or 2 hour cure, but be sure it is something thin. I use a brush to wet out the epoxy; on larger fuselages a squeegee works. Care must be taken not to pull the cloth around. The hardest part is usually the nose, as the epoxy breaks the 3m77 glue free, and the whole thing tries to frustrate you and end up in the trash can. One way to remedy this is shown in picture #3. After wetting the whole thing out, and using paper towels or a rag to dab off the extra epoxy (note the look of the weave), a rubber glove thumb (or some other item not suitable for picturing in a family magazine) can be pulled over the nose to keep the cloth stuck down.

The second layer of cloth for this fuselage, was done in my preferred method, as I happen to own a couple vacuum pumps. The cloth was cut to shape, wet out on wax paper with a squeegee, and then carbon strips were wet out. The carbon was layed along the fuselage sides (seen in the picture); then the cloth was draped, and wrapped. Since the cloth was already wet out, it sticks in place if you don't play with it too much. Have the MYLAR bag (gold colored bag materials) ready to go, with breather cloth only around the edges, so that the bag touches the fuse all around. Slip the wet fuse in the bag, and pull the bag from the ends (and sides if you have a friend), while the bag sucks down. It should end up looking like picture #4. With around 6-8 inches of vacuum, you can move things around a bit 'til you are happy; then, I go up to 15 or so, but some would draw 20 or more. If you are using white foam for this (shudder), better stick with 6 inches. Small wrinkles are fine, they sand off easily.

In picture #5, you see the wing saddle cut out. (This is a low-mid wing.) The foam was hollowed out only where the servo sticks through the wing, and will be epoxied to the bottom of the wing.

Picture #6 shows how I make wing fairings on lost foam fuses. Look carefully at the 45 degree cuts made into the foam along the inside of the fiberglass sides. These grooves are then filled with wet out carbon strands and glass, and colloidal silica/epoxy to fill past flush. The wing is then taped in place with saran wrap or packing tape to keep it from sticking (see the pic). When it dries, remove the wing, and you have a perfect fitting wing saddle.

Finally, it is time to "lose" the foam. This is an environmentally unsound procedure, so I try to gouge/pick/grind/poke as much as possible out before resorting to acetone to dissolve the rest into a goocy mess that is also very difficult to remove. All the safety things should be observed, like having someone else do this step for you. The acetone seems to soften the epoxy, so be careful, and wait a day before any



sanding or filling of the fuselage. In many cases, it is better to leave foam in the fuselage in places like corners, the tip of the nose, and even the tail boom if weight is not an issue (short tail moment slopers).

Next step is to fill any low spots, and the weave, if you used heavy cloth, with fairing compound/epoxy mix. With some experience, this can be done with one coat. B.D. taught me to use a gloved hand to swipe down the fuselage and smooth it out with one stroke. Some alcohol on the glove helps. After it cures, finish sand; then, prime/paint/install-radio/turn-radio-on and go fling it!! ■

Understanding Sailplanes

...by Martin Simons

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Flight Without Figuring Part 7

More about wing sections

In previous articles, the effects of camber on lift and the pitching moment of a wing, have been explained. We shall now consider how camber affects drag.

There are many reasons why it is important to keep drag as small as possible. For racing, drag reduces the maximum possible speed and spoils the acceleration during take off. In transport aircraft, drag slows the flight and causes more fuel to be used on long journeys, increasing costs. In general sports aeroplanes, both models and full size, drag reduces the performance all round, slowing the rate of climb, reducing speed and making the aircraft generally sluggish. These features might be acceptable for a training aeroplane but not otherwise. In aerobatics, when the aeroplane loses airspeed it is important to accelerate quickly again to allow the next part of the pattern to proceed. Drag delays the acceleration. In sailplanes, drag spoils the glide at all air speeds, making it harder to soar in weak upcurrents and bringing the sailplane down more rapidly when searching for lift, or penetrating sink.

The only time when extra drag is an advantage is when approaching to make a landing. A slow, steep final descent is helpful and reduces the length of runway needed. Most full sized aircraft these days have flaps, spoilers or air brakes to increase the drag temporarily for landing.

The sources of drag

The total drag of any aeroplane or glider has two main components, the wing drag and the rest, which is often called parasite or parasitic drag. Parasitic drag is so called because it comes from items that produce no useful aerodynamic lift. It includes tail drag, fuselage, undercarriage if any, engine cooling drag, struts, external fuel tanks and any other projections or gaps over, around or through which the air has to flow. Parasite drag is especially important at high speeds, so on racing aircraft and sailplanes every effort is made to reduce it.

Nevertheless, at all airspeeds, and for all types of aircraft, the wing is much the greatest producer of drag. Wing drag also can be divided into two main parts. There is the vortex or induced drag created by the whirling vortices which stream away behind the tips of a lifting wing. Vortex drag is most important at low flying speeds and is especially significant for sailplanes when they are flying slowly at minimum rate of sink, for soaring.

The other source of wing drag is the profile drag which comes from the shape and surface of the wing section. This, which is what we are concerned with at present, is important at all times, but increases greatly as the airspeed rises. On a pylon racing model at maximum speed, for instance, wing profile drag usually totals more than all the rest of the drag together. With a sailplane trying to penetrate sinking air by flying fast, the same is true.

The drag of a symmetrical section

Figure 1 here repeats part of an earlier diagram, showing the lift curve of a symmetrical aerofoil section plotted against the angle of attack. On the left side of the chart the section drag coefficient, cd, has now been added. (As before, small c and small d are used, because CD in capitals is not the same thing.)

The scale along the horizontal axis is the drag coefficient. The vertical scale is the same as before, lift coefficient. The drag curve of a wing section is often called its polar curve.

In practical flying and aircraft design, it is usually far more important to know what the lift coefficient is at any moment, than to know the geometric angle of attack. Hence, nowadays, drag polars are plotted directly against the lift coefficient. At each value of lift, the value of drag can be seen immediately by projecting a horizontal line to the drag polar. Knowing the cl automatically gives the angle of attack, if anyone needs to know this. The angle of attack can be read off from the lift coefficient by drawing a vertical line

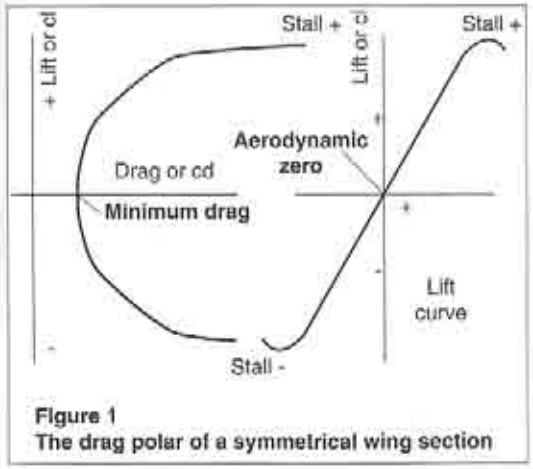

Figure 1
The drag polar of a symmetrical wing section

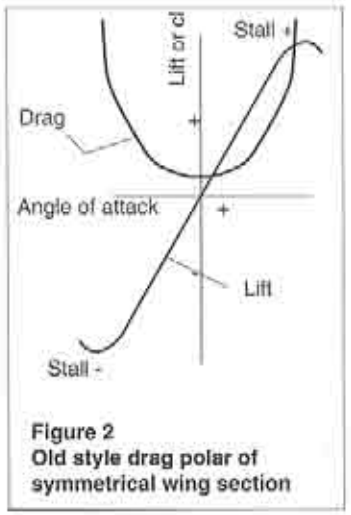

Figure 2
Old style drag polar of symmetrical wing section

from the lift curve to the horizontal axis.

In older wind tunnel test reports the drag was usually plotted with the lift coefficient against the angle of attack. An example is given here in Figure 2. The information on the two charts is exactly the same. The only difference is in the way it is arranged on the diagram.

The polar of any symmetrical section shows that the minimum drag coefficient is found when the section is at aerodynamic zero: no lift. This corresponds to a vertical dive in flight, which is an attitude that no model aeroplane is likely to hold for very long.

On either side of the zero lift minimum value, the drag rises. The increase is not very rapid to begin with. When a symmetrical section is operating at very low angles of attack, on either side of the aerodynamic zero, the drag will remain quite low. For this reason, tail surfaces on models are most satisfactory if they have symmetrical sections. They are often required to produce some lift force, either to balance the trim of a model or to change the attitude of flight, or to stabilise it. They will often have to operate at small angles of attack, on either side of the zero. But they are not required to produce very large amounts of lift.

If a tailplane, for instance, is rigged in such a way that it has to produce a lot of lift, and hence has to work at a high angle of attack, it will produce far too much drag for its size and will reduce the efficiency of the model. Cambering the section of such a tail will help a little, but not enough to justify the bad design. (Free flight model fliers still do not seem to have realised this. They would get better results with symmetrical tailplanes rigged to give no lift in level flight. On average, tail units create least drag if they are symmetrical in section and are rigged to act as stabilisers only.)

As the lift coefficient of the symmetrical profile moves further from zero in either the positive or negative direction, the polar shows a gradual increase in drag. Each increase of lift coefficient brings a small penalty.

When the airflow begins to separate near the stall the drag polar shows a very rapid increase and, once the wing is fully stalled, the drag is so great that the curve runs completely off the chart.

The drag polar of a cambered profile

In Figure 3, the lift and drag curves of a cambered profile are shown, with the symmetrical profile indicated faintly for comparison.

As shown previously, the first effect of cambering a wing is to move the lift curve to the left and upwards as a whole, on the chart. The drag polar also moves, as a whole. As before, on either side of the minimum drag, the curve shows a fairly gradual rise at first, but near the stall there is the same kind of rapid increase, indicating flow separation on the wing.

The minimum drag of the cambered section is not at the aerodynamic zero. Instead, the profile gives its least drag at some positive, useful, value of lift. This fact is the fundamental reason why cambered sections are used. Except for aerobatic aeroplanes, aircraft normally fly the right way up and their wings have to produce lift to support them. By using cambered

wings drag is reduced at positive lift values.

More camber

In Figure 4, this is taken a stage further. The amount of camber is increased in three stages, to produce lift and drag curves for three different sections. The original symmetrical section is still visible for comparison.

A strongly cambered section has its minimum drag at a high lift coefficient, the less cambered sections have minimum drag at lower lift coefficients and of course the symmetrical section has least drag at zero lift.

The ideal lift coefficient

It is now easy to see that any cambered wing section has an ideal lift coefficient, the value at which it will fly with least profile drag. The greater the camber, the higher the ideal lift coefficient will be. The aircraft designer should consider what kind of flying the aircraft will do and match the camber to this.

Suppose an aircraft is going to spend much of its time in the air at, or close to, one particular airspeed, like a transport aircraft. The aeroplane takes off and gets to its normal flying altitude as soon as possible. Then it is trimmed for its most efficient cruising speed, which is its minimum drag airspeed or, in the usual jargon, the speed for best L/D or best lift to drag ratio. The lift force required from the wings must equal the total weight, which varies only slowly as the fuel is used.) When the drag is at its minimum, the ratio of lift to drag is highest. With small adjustments to compensate for the weight loss the aeroplane remains close to the same lift coefficient and the same wing angle of attack, for most of the journey. The camber of the wing profile is chosen, in the design office, so that the profile drag will be at its minimum at the appropriate lift coefficient. Small variations on either side make little difference because the drag polar shows only slight increases on either side of the minimum.

It would obviously be a very bad design if the wing camber was chosen so that the normal cruising speed of the transport plane always found the wing at the wrong point on the drag curve.

As another example, if the aeroplane is a model pylon racer, when flying at maximum speed it will be at a very low lift coefficient. This is because the speed is high. (The 'square law' operates, doubling the airspeed multiplies the lift force at a given angle of attack by four.) In Figure 5, the lift coefficient at which such a racer might be flying is indicated on the chart. The camber of the wing section has been chosen so that minimum drag will occur when the model is flying at its fastest. Since the profile drag is low, the maximum speed of the model will be improved.

Suppose, instead, the designer chose a profile with more camber. The polar of such a section shows that the drag at best speed would be too high and the model's top speed would be disappointing.

Model racing aeroplanes have to perform steep turns round the pylons and, at these times, have to fly at high lift coefficients. It is necessary to keep the wing drag down in the turns as well as on the straight, so the camber of the section is not chosen purely for straight and level speed performance. A compromise is necessary or, by using flaps, the camber of the wing might be altered to suit the different requirements.

The ability to change the camber of a wing in flight, is the main reason why simple flaps are often used on advanced types of competition aircraft, as well as for landing and taking off.

As another example, if a sailplane is to soar in very weak thermals, it will need to fly at its minimum rate of sink, which is normally a trim quite close to the stall. The wing, at such times, will be at a high lift coefficient. In order to reduce the profile drag as far as possible, a strongly cambered profile is needed (Figure 6). Such a section has its minimum drag at high lift and the sinking rate of the sailplane will be reduced. it would obviously ruin the soaring performance of this sailplane, if it had a section with too little camber.

Again, compromise is necessary because sailplanes also need to fly fast to penetrate through sinking air and reach another thermal quickly. As before, this might be achieved by using flaps to change the camber. The main point at present is to recognise that the camber of the wing section has to be chosen carefully to match the type of flying that the aeroplane will do most of the time. ■

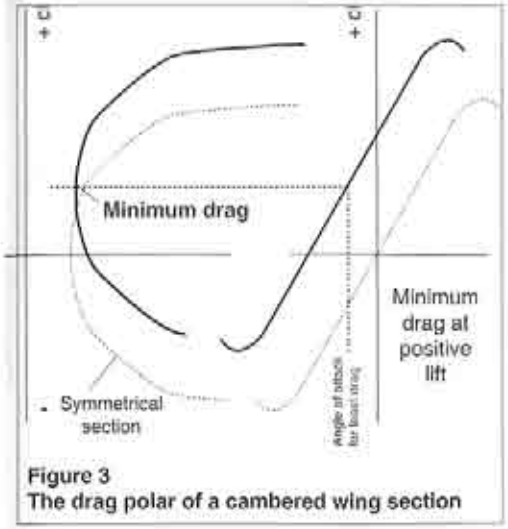

Figure 3
The drag polar of a cambered wing section

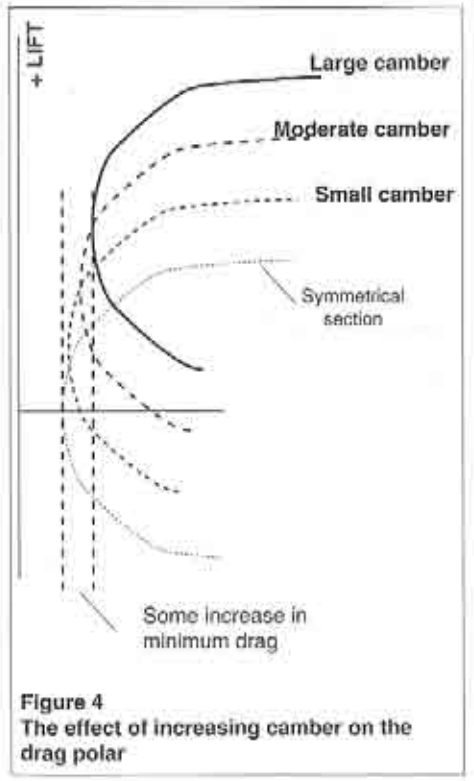

Figure 4
The effect of increasing camber on the drag polar

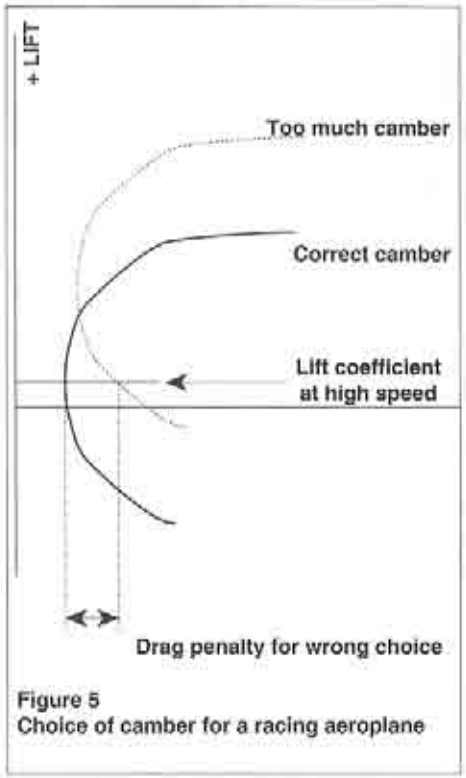

Figure 5
Choice of camber for a racing aeroplane

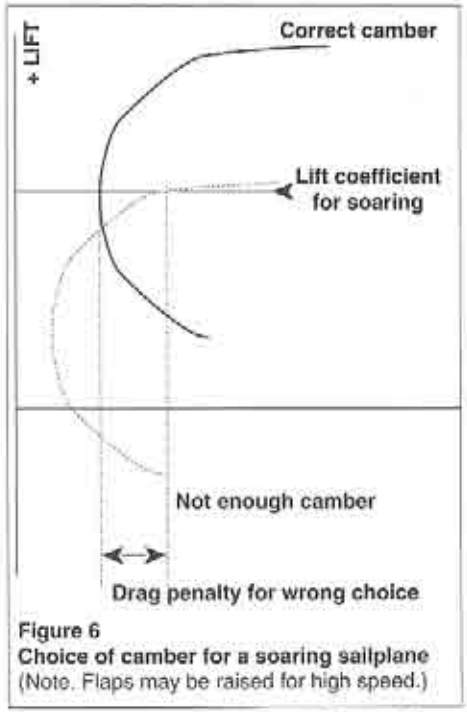

Figure 6
Choice of camber for a soaring sailplane
(Note. Flaps may be raised for high speed.)

Schedule of Special Events

Date	Event	Location	Contact
Feb. 3-4	SW Winter Soaring	Gilbert, AZ	Iain Glithero, (602) 839-1733
Feb. 24-25	2m, Unl.	Cape Coral, FL	John Agnew, (941) 936-7148
March 22-25	New Zealand Soaring Championship	Taupo, New Zealand	Chris Kaiser, 64 9 480 8739 chrisk@dse.govt.nz
Mar. 23-24	2m, Unl.	Orlando, FL	Hank McDaniel, (407) 831-3688
Apr. 20-21	2m, Unl.	Orlando, FL	Hank McDaniel, (407) 831-3688
May 17-19	Slope Scale Soar-In	Los Banos, CA	Lynsel Miller, (408) 275-6403
May 18-19	Spring Fling	Davis, CA	
May 24-27	2m, Unl., Fun, XC	Morriston, FL	Ken Goodwin, (904) 528-3744
June 1-2	1st Annual Northeast Aerotowing Fly-In	Elmira, NY	John Derstine, (717) 596-2392
June 1-2	LSF V Task Weekend	Tri-Cities, WA	Don Pesznecker, (503) 659-9624
June 7-9	Second Annual Aerotowing & Scale Fun Fly in the South	Fayetteville, NC	Wayne Parrish, (919) 362-7150 Bernie Coleman, (704) 536-5260 b1rdbernie@aol.com John F. McCullough, (919)851-3538 jem1@nando.net
June 8 - 9	SWSA 2M Soarfest '96	Covina, CA	Pete Olsen, (909) 597-2095
June 20 - 23	Mid-South Championships	Memphis, TN	Bob Sowder, (901) 751-7252
June 29-30	Ontario Grand Prix Soaring	Cookstown, Ontario	Jack Nunn, (705) 728-4467
June 29-30	Scale Soaring	Ontario, Canada	Gerry Knight, (905) 924-7451 Don Smith, (905) 934-3815
June 29-30	I.G.G. Aerotow Fly-In	Belpmoos (Bern), Switzerland	Jack Kagi, 011-41-01-926-2187
June 29-30	2m, Unl.	W. Palm Beach, FL	Jim McCudden, (407) 967-8909
July 16-21	Canadian R/C Soaring Nationals - Write: SOAR NATS 96, 18C Arnold Dr., Nepean, Ontario, Canada K1A 0K2	Ottawa, Ontario	
Aug. 3-4	2m, Unl.	W. Palm Beach, FL	Jim McCudden, (407) 967-8909
Aug. 24-25	I.G.G. Annual Scale Slope Soaring Festival-Swiss Alps	Adelboder, Switzerland	Jack Kagi, 011-41-01-926-2187
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Sept. 21-22	2m, Unl.	Orlando, FL	Hank McDaniel, (407) 831-3688
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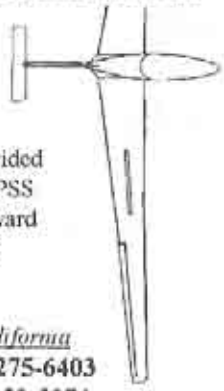

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Vintage Sailplane Association
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R/C Soaring Resources

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

Contacts & Soaring Groups - U.S.A.

Alabama - North Alabama Silent Flyers, Ron Swinehart, 8733 Edgehill Dr. SE, Huntsville, AL 35802; (205) 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 - Torrey Pines Gulls, Ron Scharck, 7319 Olivetas Ave., La Jolla, CA 92037; (619) 454-4900.

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

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

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

Hawaii - Maui Island Slope Soaring Operation, MISO, Hank Vendiola, 10-C Al St., Makawao Maui, HI 96768.

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.

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

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

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

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

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

Maine - DownEast Soaring Club (New England area), Steve Savoie (Contact), 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 & Northern Virginia - Capital Area Soaring Association (MD, DC, & Northern VA), Steven Lorentz (Coordinator), 12504 Circle Drive, Rockville, MD 20850; (301) 845-4386.

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

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

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

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

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

Tennessee - South Central Area, Brian Smith, 317 Crestwood Dr., Tullahoma, TN 37388, (615) 393-4876, anytime.

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

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

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

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

Outside U.S.A.

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

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

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

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

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

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

BBS/Internet

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.

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

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

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Reference Material

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

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

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1/5 scale Grob 103A Twin Acro, built by Peter Zak, complete w/7 servos, set up for aerotowing, excellent condition, flies great... $575.00 + shipping; Weston Merlin, 6% complete, 6 servos, red & white, only 12 flights on plane... $400.00 + shipping. Jack, (215) 547-4243 after 6 pm EST, Pennsylvania.

JR 388S, NIB, PCM/glider version, still factory sealed, 2 341's... $585.00 including shipping. Tom Gressman, (303) 744-3535 (w), (303) 979-8073 (h), Colorado.

Mako w/HQ2.5/9 wing, flies very well... $350.00 + S&H; Genesis, flown very little, red and white... $295.00 + S&H; Falcon w/Spectrum S3021 wings, fun to fly... $350.00 + S&H; Synergy '91 w/1000 Ma battery, orange & white... $450.00 + S&H; Spectrum, S3021 wing, just like new... $350.00 + S&H. Dale, (214) 475-8093, Texas.

1/4 scale ASW-20, completely built, ready to fly, from a Terry Luchenbach kit, scale cockpit detail, excellent flight performance... $650.00; Thermal Eagle, completely built, RG-15 airfoil, w/battery pack and extra set of stabs, excellent condition... $350.00. Sal, (516) 922-7432, after 6 pm EST, New York.

Scale model sailplanes: KA6E, 3.9 m, yellow/white, very nice; Pilatus, 3.5 m (Thermo Flüg); DG300, all-molded fiberglass, 3.75 m, highly detailed. All are completed, finished w/servos, in great condition, outstanding flyers. Dan Troxell, (714) 831-8013, So. California.

Vision radio w/3 receivers... $450.00; Super-V 100" with all servos... $595.00; 2m Banshee with all servos... $275.00; 116" Grifter with all servos... $385.00; Gold Box Futaba 7ch radio comp... $135.00; 2m Ace Easy Eagle... $75.00. Henry Cox, (615) 967-6890, Tennessee.

NIB Kits + UPS. Dodgson Camano 214... $175.00; Dodgson Camano 205... $150.00; Dodgson K-Minnow 193... $125.00; LJM Olympian F3E... $200.00; LJM Meteor... $150.00; Pacific Sailplanes Kestrel 19... $175.00; Pacific Sailplanes Haba... $150.00; Aeronaut Aerofly... $100.00; Aeronaut Ektro-Cat... $75.00; Robbe ASW-24... $300.00; Robbe SF-36... $275.00; Robbe Saphir... $175.00; Robbe Charley (Sky Diver)... $150.00; Multiplex Arriba E... $400.00; Multiplex Alpha E... $225.00; Multiplex Akro... $225.00; Multiplex Alpina CS... $550.00. Craig Christensen, (612) 435-7406, after 4:30 pm, Minnesota.

C.R. Aircraft Raider slope racer, two sets of wings (96" & 110"), 6 Airtronics servos (5 of them are 141's)... $650.00 for all (just add receiver); Synergy III SE, RTF, just charge battery, 6-141's, 1000 mah pack, good condition, white w/black bottom surfaces, a steal at... $650.00; Genesis, excellent condition, red w/blue bottom surfaces & rudder, 4-141's, Becker servo mounted in fin for elevator, includes SR 1400 mah pack, just add receiver & go fly... $600.00; Thermal Eagle fuselages, brand new... $60.00 ea.; Composite Renegade wing... $90.00 Scott Condon, (616) 471-2453, So. Calif.

Twin Acro III, 9 lbs., E203, 4 meters (Roebers), NIB... $495.00; huge towplane, 134" span, will tow the largest sailplanes, 1/3 L5 with Saks 8.4 twin and Futaba servos, mint condition... $2500.00; German tow plane - Roebers Sky Wing, 99" span, suitable for 1/4 sized & larger gliders, NIB... $475.00. Robin Lehman, (212) 879-1634, New York.

Wanted

Fiberglass fuselage for Craft-Air Viking sailplane. Bob Parker, (408) 997-3417, California.

Alpina Magic. Ela, (415) 459-1877, N. Calif.

Right wing & canopy & frame for Graupner Cumulus. David, (309) 829-5564, after 7 pm, Illinois.

FM Vision 3.0. Jack Dorris, 1507 Canterbury, Richardson, TX 75082, (214) 783-1922.

This event is open to anyone with a $5 landing fee, a valid AMA license, and a real interest in scale sailplanes. It is being held to bring scale enthusiasts together for a fun time and to meet others who love flying beautiful sirplanes. Scale soaring is growing by leaps and bounds. Five years ago, scale sailplanes were scarce and aerotowing was a dream. Today, scale sailplanes are admired wherever they are flown, and aerotowing is catching on fast. Our first effort in May, 1996 brought 14 pilots, 12 sailplanes and 4 towplanes together for some great flying. The weather was great, and the 1/2 mile square hay field is ideal. It was the first time aerotowing for most, but all wanted to know when we were doing it again. Now they know! If you want to learn how to aerotow your sailplane, to learn how to be a towplane pilot, to share your plane with others, or just have fun, come fly with us! The field is easy to find. It is in the heart of North Carolina's Costal Plains off I-95. Take I-95 exit 58 east on U.S. 13 for 2.2 miles, turn right on Hayfield Rd. for 1.5 miles to stop sign, straight at stop sign for 1/4 mile, and field is on left. There are motels close by and some of the best Southern Fried Chicken you have ever tasted!

Classified Note

Please note that the cut-off date for classified ads has been changed to the 1st of the month.

The cut-off date for display ads is also the 1st of the month, and the ad must be camera ready.

TIDBITS & BITS

Please help, again!

One of you was kind to provide information back in 1993 that was very helpful, and we're hoping that you can help us, again.

In the May, 1993 issue of *RCSD*, we published a request from Cameron Ninham of South Africa regarding locating information on a glider wing. He said, "The glider (wing) is called a Scorpio II, designed by Mads Bendt of Denmark. It has a 32" span, built of foam, and covered simply with brown paper and PVA glue. It is intended as a quick build, "no-care-for" (If it crashes, just assemble another one...), aileron trainer. I only know that the plans were advertised in some model magazine. Could you please help me?"

Well, Cameron is not in South Africa, but most of his belongings are, along with the information he needs, again. He is part of the research group at UIUC and can be reached at (217) 244-0492 (w), (217) 244-0684 (w), (217) 344-4342 (h), (217) 244-0720 (fax), e-mail: ninham@uiuc.edu. Or write: University of Illinois at Urbana-Champaign, Dept. of Aeronautical & Astronautical Eng., 306 Talbot Laboratory, 104 S. Wright St., Urbana, IL 61801-2935.

UIUC Event

The following announcement is also from the UIUC folks.

"The research group here at UIUC, involved with the UIUC Low Speed Airfoil tests, is thinking about hosting a soaring competition here at the University at Urbana-Champaign, Illinois.

"No dates have been set, but we were thinking of some time during late spring, or early summer (1996). The classes will be hand launch, two meter, and open class (thermal). The emphasis will be placed on flying (soaring), and not landings! Also, we will probably be using high starts, due to the lack of winches.

"If anyone is interested, we would like to hear from you. So, please contact myself, ninham@uiuc.edu, or Chris Lyon, c-lyon@uiuc.edu. Any suggestions are welcome."

The address for the University is shown above.

A Bit of Humor

The following is from Paul Nauck in California. He says he laughed when he heard it, and thought some of you would like to laugh, too. Author unknown.

"Interview on radio with Swedish air ace after the big war..."

"Emcee: Can you tell the listening audience one of your more memorable sorties's?

"Swedish air ace: Yes, I was flying patrol one day and I looked ahead and saw three German Fokker's coming straight at me. I looked to the right and there they were, two more German Fokker's. To the left, four more German Fokker's.

"Emcee: Let me break in for a moment, for the listening audience that are not all that knowledgeable about aircraft. A Fokker is a German attack fighter aircraft?

"Swedish air ace: That is correct, but these German Fokker's were flying in Messerschmitt's."

Hmmm. Paul is also an immigrant from Germany...

Do you live near Redding, California?

We have few subscribers that live in the Redding/Chico areas of Northern California, so when we received the following request from Harry Sagray, a former Texan (San Antonio), we thought that maybe some of you could help him out.

"I've been in Redding approximately 18 months and having trouble getting, or finding, others interested in R/C soaring. I come from the Bay Area and belonged to the South Bay Soaring Society for years.

"Do you know of clubs nearby or groups interested in soaring?"

(signed) Harry Sagray, 19235 Snowburst Ct., Redding, CA 96003.

Well, Harry, by the time you read this you will have already gotten a care package from us with the names and addresses of a couple of clubs, although they are not real close to where you live, and some names of the small handful of subscribers that appear close enough for you to call. Hope this helps!

Back to Illinois

The photo was sent in by Bill Christian of Arlington Heights, Illinois, who says, "The enclosed photo was taken in November, 1995, of S.O.A.R. members (L - R) E. Fred Fredrickson, Bill Christian, and Burt Marx. The sailplanes are called "Fredgend", and are made with fiberglass fuselages made by Fred Fredrickson, having the same moments as the Legend, and Legend SC wings. The sailplanes are fine performers, Fred having won 2 club contests this year with his ship."

Thanks, Bill.

I.G.G. Aerotow Fly-In

Robin Lehman of New York dropped us a note regarding the upcoming events in Switzerland this year. He says, "One bit of news I just learned, which might be of interest to some of the readers, is that this year's I.G.G. Airtow Fly-In in Switzerland is scheduled for the very same airfield which I had visited some five years ago, and which

really is the inspiration behind all of my airtow and Sailplanes Unlimited, Ltd. mania. This fly-in is scheduled for the 29th and 30th of June at Belpmoos (in Bern), Switzerland. You may remember the original article, which I wrote for *R/C Modeler* (November 1992). Just in case any of the readers find themselves in Europe at that time, this is probably the largest gathering of scale sailplanes anywhere on our planet. I am enclosing a photograph of that get together just in case you wish to use it along with the above information. My contact in Switzerland is Jack Kagi (Chergerten 14, 8712 Stafa, Switzerland - telephone 011-41-01-926 2187). Jack speaks perfect English, and was indispensable in being my translator during my first encounter with this wonderful, enthusiastic group!

"The I.G.G. will also meet for their annual scale slope soaring festival on the 24th and 25th of August in the Swiss Alps at Adelboder. I'm really not quite sure where that is, but Jack surely knows!

"Either one of these events is well worth going out of your way for, should you find yourself in Europe during one of those dates. Seeing so many wonderful, scale sailplanes in one place is an unforgettable experience!"

Thanks, Robin, and we've added the events to the schedule.

Please call back!

Several of you called Robin Lehman, Sailplanes Unlimited, Ltd., and expressed an interest in obtaining a Krause 1/3 sized Salto. Because of all the calls he received, he has decided to import them, again, and says, "...I personally considered the Krause 1/3 sized Salto to be the best flying and nicest looking Salto kit in existence. But I sat with three of these for some eight months without so much as an inquiry, and then sold them all more or less in the same few days.

"I had at that point decided not to import any more of these kits, which seemed somewhat unpopular. Subsequently, I received four or five calls from various interested parties, and told all of them I was not importing this kit anymore due to lack of interest. However, after the fifth call or so, it dawned on me that, perhaps, there were quite a few people who might be interested in the Salto, after all. So, I placed an order for more Saltos, which should be in the U.S.A. by the time this goes to print. So, for those of you who did call and are interested in this wonderful scale ship, it is available and I have several sitting here waiting to find a new home."

Robin's number is (212) 879-1634.

I.G.G.

Joe Wurts in New Zealand

The following is from Chris Kaiser in New Zealand.

"Joe Wurts, the former World F3B champion and winner of most major U.S. soaring titles, will again be the special guest at the 1996 New Zealand Soaring Championship. Joe will give talks and flying demonstrations at the event, which will be held 22nd to 25th of March at Taupo in the Central North island.

"As a result of Joe's last visit, the standard of soaring in New Zealand took a major leap forward. We learned to read the air better, work thermals harder, and tune our models aerodynamically through the set-up of computer radios; we also learned how to build better, lighter models, plus many more tricks of the trade, from a world champion.

"While in New Zealand, Joe will give a series of lectures and flying demonstrations, as well as compete alongside the rest of the competitors at the Soar Champs. Joe says he gave us the beginner/intermediate lectures the last time, and he is keen to build on that and teach us some more advanced ideas.

"Joe proposes to talk on the following subjects, and more; you ask the questions:

1) More on thermal reading.
2) How to optimize thermal flight (recentering, reading where the stuff is good).
3) 1995 Romanian WC's "what happened", and new developments.
4) F3B training, beginning to expert stuff. (There are a couple of new things since last time, but mostly some thoughts refined, although I think that you guys will not info. overload quite so quickly.)
5) Optimizing the launch. (Still a major error around the world, and one of the reasons why we impressed the comp. in Romania.)
6) HLG flying. (Kinda goes with 1 & 2.)
7) Slope racing.
8) Cross Country. (I know you guys really aren't into it much yet, but it is "such" a fun event...)
9) You pick. If it is motorless, I've had fun with it.

"Taupo is a tourist centre in the central North Island of New Zealand. the major attractions are its beautiful lake and mountain scenery, and its many geothermal sights, hot water, and mud pools. Being in the centre, it experiences less wind and rainfall than coastal regions. There is plenty of motel-style accommodation.

"Events flown in the Soar Champs will include F3B, possibly F3J, HLG, thermal and electric duration tasks and, wind and site permitting, slope racing.

"For more information, please contact: Chris Kaiser, 74A Pupuke Road, Northcote, Auckland, New Zealand; ph: +64 9 480 8739, e-mail: chrisk@dse.govt.nz."

Great Lakes R/C Soaring League

The First Annual 1.5 Meter Sailplane Postal contest was held September 16, 1995, and Ray Hayes sent in the following.

"Wind, wind, and more wind... It was windy in North Carolina, New Jersey, Michigan, Germany, and Australia on the day of our postal contest. What about Florida? Well, Kale Harden described his weather in one word, "Great!" So it goes, the best laid plans of mice and men...

"My flying experience during the last twenty five years has shown the middle of September to be a great flying time. A lot of high pressure cells, blue skies, and warm temperatures, are usually true, but not this time. Kale suggested including a club contest in the next postal, which sounds like a good idea. The Pelicans of Florida had ten members fly in this postal. Don Groggin and crew didn't fly due to the short notice and, if they had, probably would have given the troops in Florida some real competition. The weather is always nice in Mesa, Arizona.

"A special tribute goes to Wes Deetz of the Sussex County Thermal Sniffers. His New Jersey club started the day with six fliers and, due to ever increasing winds, was the lone survivor. he flew all eighteen hi-start flights. My kind of guy. Wes missed first place in the hi-start event by 26 seconds.

"It rained on the three fellow fliers in Germany after getting in just one round of flying, and it was equally nasty in Australia. Because of all the bad weather and subsequent scores, I have decided to simply announce the winner. Most contestants flew the hi-start event rather than the hand launch event. Thirty four contestants competed in this event. Congratulations!

"Hi-Start Event Winners: (1) John Gunsaullus - Florida, (2) Wes Deetz - New Jersey, (3) Kale Harden - Florida.

"Hand Launch Event: (1) Paul Sherman - Michigan, (2) Ray Hayes - Michigan." ■

NEW PRODUCTS

Vindicator

...from McLean's Models
...by Brian McLean

The Vindicator is designed for 60" slope racing and high performance slope soaring. The overall clean design of this racer makes it extremely fast, efficient, and competitive. The low drag wing and V-tail design allow the Vindicator to literally flick through pylon turns and blaze down the straight-a-way. This plane will fly well in a wide variety of lift conditions and is stable throughout its wide speed range. The wings are made from epoxy/carbon fiber/glass skins vacuum bagged over foam cores. The ailerons (or ailerons and flaps) are pre-cut and closed out with fiberglass. The hinging is completed using a gap seal and silicon. The wings are of the modular plug-in design using a 5/16" steel or carbon fiber joiner rod. The fuselage is light and strong made from epoxy/fiberglass/kevlar and is prepped with wing joiner and locator tubes. The V-tails are made from epoxy/fiberglass skins vacuum bagged over foam cores. The V-tail assembly is also modular and comes pre-mounted to the fuselage. The ruddervators are hinged and actuators installed. The Vindicator ARF kit comes with all hardware and requires only some minor final assembly, radio installation, and painting. The standard kit comes set-up for 4 micro servo operation, 2 for ruddervators and 2 for ailerons. The optional aileron/flap version requires 6 micro servo's.

Please contact Brian McLean at: 75 Fleurance, Laguna Niguel, CA 92718; (714) 363-7331. ■

Specifications:

Wing Span:	60 in.
Wing Area:	395 sq. in.
Weight:	34 oz. min.
Wing Loading:	12.4 oz./sq. ft.
Airfoil:	S6061 8.5% thickness
Price:	$275.00 aileron version $295.00 aileron/flap version

New Products

NEW PRODUCTS

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

New Catalog & Osprey 1

...from Sky Bench Aerotech
...by Ray Hayes

Our new catalog includes 6 different hi-starts, electric winches, R/C systems & components for sailplanes, a new line of Osprey kits, ARF's with laser cut technology, hardware & builder supplies, and a special light weight covering material including a new plastic film, FLIGHTCOAT, that is almost weightless.

Send $1.00 (redeemable with first purchase) to Sky Bench Aerotech, P.O. Box 316, Washington, MI 48094; (810) 781-7018.

The Osprey 1 R/C hand launch sailplane kit is an easy to fly, easy to build, durable pod and boom. The completed model weight before R/C installation is 6.45 oz. with a flying weight of under 10 oz.; wing area is 415 sq. in. with 53014 airfoil. Wings feature Schueman planform tips, and wing ribs are laser cut. Light tail boom is of temperature resistant fiberglass; rudder and stab are contest grade, sheet balsa wood pre-shaped for faster building. Kit is complete with illustrated step-by-step instruction manual, all parts & hardware, and super light weight covering material for open sections of wing panels.

Recommended for beginner or expert, available at local hobby shop or Sky Bench Aerotech. Kit cost is $49.95 + $6.00 S&H; ARF version is $119.95 plus $20.00 S&H; RTF version complete with Cox Cobra 3 channel/2 micro servos and Rx (needs 12 AA batteries) installed is $285.95 plus $20.00 S&H. Other R/C systems available.

Construction Kit 101 is ideal for beginners or to restock the workbench and includes Perma Grit Lifetime Balsa Wood Sander, 1 oz. Sig CA Glue, 2 oz. Sig 5 Minute Epoxy, 2 oz. Sig Wood Glue, builder's T-pins, 6 single edge industrial safety razor blades. Cost is $24.95 with free shipping if ordered with a Sky Bench kit. Add $6.00 if ordered separately. Address above. ■

Grand ESTEEM

...from Inventec Corporation

Esteem, 110" and 120" wing span sailplane kits, are now being offered with composite wings, stab and rudder. A new kit, Grand ESTEEM, allows one to choose between a full flying stab conventional mounting, and a T-tail mode. Incorporated in the new kit are improvements which allow for greater speed reduction on landing. The wings retain the CF 1/2 diameter tube spar design, which extends 60% of the wing span. Average weight of panels is 18 oz. Flying weight on standard set-up is 54 - 56 oz. Kit is basicly ARF; just install radio and add color trim. Deliveries are 2 - 4 weeks.

Inventec Corporation, 808 David Dr., Trevose, PA 19053; (215) 953-1736. ■

NC Eagle Fuselage

...from TauCom
...by Manny Tau

TauCom is pleased to make available the new NC Eagle Fuselage (NC = Nose Coned). The popular Thermal Eagle/F3B Eagle and its proven design was the starting point for this after-market fuselage. New modifications were employed to upgrade the fuselage, integrating feedback from the RC soaring community. The plugs, molds, and parts are all professionally made with many years of experience. Hence, a new generation of this fuselage was born, perfect for the scratch builder or as a replacement fuselage for one's favorite, unlimited glider.

NC Eagle Fuselage is a perfect replacement for Thermal/F3B Eagles with upgraded modifications, and has similar dimensions (51" length) utilizing a 10" RG-15 airfoil wing root. Has a slip-on nose cone with integrated, small-tooth skeg which can be cut or sanded off; tail skid is integrated to keep the rudder off the ground. Uneven trailing edges on vertical fin facilitate a "knuckle joint" rudder hinge. There is a full length Kevlar™ strip from nose to vertical fin's trailing edge, plywood reinforcement at the wing rod and stab pivot areas, and pre-pigmented epoxy with a translucent neon yellow colored fuselage.

Cost is $100.00 + $11.00 S&H. California residents add 7.75% sales tax. TauCom, 2490 S. Ola Vista #28, San Clemente, CA 92672; (714) 492-9553; fax: (714) 586-8508; e-mail: taucom@kaiwan.com. ■

Advertising

Advertiser Index

Design Suggestions

Wing Span	142"
Airfoil	E392
Controls	Rudder, Elevator, Ailerons, Spoilers

The fuselage has a molded wheel fairing and added support in the fin to support its T-tail. Photograph shown here is a finished model of a full-size.

1/5 Scale ORNITH

Short Kit Contents
49" Epoxy Fiberglass Kevlar™ Reinforced Fuselage, Crystal Clear Canopy, Fiberglass Canopy Tray, Drawing

Price: $90.00 + $10.00 S&H

Scale

Epoxy Fiberglass Fuselages	Price	S&H
1/6 Scale DFS Reiher V2 (120"/Scale/4)		
46" fuse, canopy, plans	$85.00	$10.00
1/5 Scale ASW-19/20 (132"/RITZ III/4)		
54" fuse, canopy, plans	$85.00	$10.00
1/5 Scale Nimbus (159"/Wortman/4-5)		
54" fuse, canopy, plans	$85.00	$10.00
1/5 Scale Rhoenbussard (112.5"/Scale/4)		
40" fuse, plans	$80.00	$10.00
1/5 Scale ASW-17 (135"/Mod. Eppler/4-5)		
49" fuse, canopy, tray, dwg.	$90.00	$10.00
1/5 Scale Orlice (135"/E392/3-4)		
49" fuse, canopy, tray, dwg.	$80.00	$10.00
1/5 Scale Ornith (142"/E392/3-4)		
49" fuse, canopy, tray, dwg.	$90.00	$10.00
1/5 Scale Salto (90"/E387/3)		
42" fuse, canopy, plan	$80.00	$10.00
1/4 Scale PIK-20 (150"/E203/4-5)		
64" fuse, canopy, tray, dwg.	$155.00	$20.00
1/4 Scale DG-100/200 (147.5"/Wortman/4-5)		
64" fuse, canopy, tray	$155.00	$20.00
1/4 Scale Libelle (154"/RITZ I/3-4)		
58.5" fuse, canopy, frame	$155.00	$20.00
1/4 Scale Jantar (187" or 202"/Wortman/4)		
67" fuse, canopy, plans	$155.00	$20.00
1/4 Scale HP-18 (147"/RITZ III/4)		
69" fuse, canopy, plans	$145.00	$20.00
1/4 + 10% Scale Salto (142.5"/RITZ I/3-4)		
61" fuse, canopy, frame, plan	$155.00	$20.00
1/4 Scale SZD-30 Pirat (147"/Clark Y/4)		
62" fuse, canopy, plans	$155.00	$20.00
1/4 Scale Kestrel (167" or 187"/RITZ/4-5)		
63" fuse, canopy, frame	$155.00	$20.00
1/3 Scale ASW-19/20 (16.5'/Wortman/4-5)		
89" fuse, canopy	$250.00	Call
Semi-Scale ASK-14 (90" or 110"/flat bottom/4)		
(motor glider .15 cube in. or electric)		
40" fuse, canopy, plans	$80.00	$10.00

VIKING MODELS, U.S.A.

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These epoxy fiberglass fuselages include suggested specifications (Wing Span/Airfoil/Radio Channels). We do not carry a large inventory, but rather custom make each fuselage as the orders are received. Normal delivery time for most partial/short kits and canopies is 10 days. Large orders take longer. Please call.

Short Kit Contents
49" Epoxy Fiberglass Kevlar™ Reinforced Fuselage

Price: $75.00 + $10.00 S&H

Servo Cover Set w/Instructions
Covers 1 1/2" x 1 1/2" Servo Well
Trimming Req. $4.95 per set

Need Custom Mold Making?
Please call.

STILETTO RG-15

Canopies & Accessories

An in-house vacuum form machine allows us to produce our own canopies, which are made using PETG .040. If you are looking for a canopy or other vacuum formed accessories (including sailplane, power, etc.), please let us know. We have a large inventory of canopies and do short production runs. Manufacturer inquiries are welcome.

Glider type from 11" - 24"
Standard type from 4" - 18"
Detailed type from 6" - 13"
Others - Various Sizes

Price Range:

Glider Type	$5.00 - $18.00
Standard Type	$4.00 - $12.00
Detailed Type	$4.00 - $12.00

Design Suggestions

Wing Span	100 - 136"
Airfoil	RG-15
Controls	As Required

3-view available. Plug-in wing.

Fuselage designed to take a heat shrink battery pack in the nose, with a standard size receiver, on/off switch, and 3 standard size servos in tandem. Fuselage designed by Bernard Henwood. Recommended for thermal or slope, intermediate to expert.

Thermal or Slope

Epoxy Fiberglass Fuselages	Price	S&H
Aeolus III (60"/NACA 63A010/3)		
43" fuse, plans	$65.00	$10.00
Condor 3m (bolt-on wing mount/up to 10" chord)		
52 1/4" fuse, nose cone	$80.00	$10.00
Contestant (148"/E205/3-4/10.5" chord)		
60" fuse, canopy, tray	$80.00	$10.00
Elf 2m (bolt-on wing mount/up to 10" chord)		
44 3/8" fuse, nose cone	$70.00	$10.00
Facctor (83"/E193/3)		
41" fuse, hatch, plans	$75.00	$10.00
Oden (100-130"/S3021/As Req./10.25" chord)		
51" fuse, canopy	$75.00	$10.00
Raven 3m (119"/Mod. E193/As Req./10.75" chord)		
51" fuse, plans	$80.00	$10.00
Smoothie (100"+/None/Var.)		
49" fuse, hatch	$70.00	$10.00
Special Edition (100-130"/Any/As Req./9.625" chord/bolt-on wing)		
54" fuse, nose cone	$80.00	$10.00
Stiletto I (100-136"/Any/As Req./10" max. chord/plug-in wing)		
49" fuse	$75.00	$10.00
Stiletto II (100-136"/Any/As Req./10" max. chord/bolt-on wing)		
49" fuse	$75.00	$10.00
Stiletto RG-15 (100-136"/RG-15/As Req./plug-in wing)		
49" fuse	$75.00	$10.00
Stiletto HQ2.5/9 (100-114"/HQ2.5/9/As Req./10" root cord/plug-in wing)		
49" fuse	$75.00	$10.00
Zen (100"+/None/Var.)		
51" fuse, hatch	$75.00	$10.00

All fuselages are Kevlar™ reinforced.

??NEED WINGS TO GO WITH THESE FUSELAGES??

Selected foam cores are available thru Elf Engineering:

Dale King
1111 Highridge Drive
Wylie, TX 75098
(214) 475-8093

Foam cores or Ben Matsumoto, custom, glass bagged wings, stabs, rudders and other building services for all Viking Models, U.S.A. fuselages are available thru California Soaring Products.

California Soaring Products, Paul Ikona
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Sky Hawk

MICHAEL LACHOWSKI WINS 1995 EASTERN SOARING LEAGUE CHAMPIONSHIP SERIES FLYING SKYHAWK!

Available in Michael Selig "Red Hot" S7012

Designed by Mark Allen
Packaged by Slegers International

Sky Hawk kit features a kevlar - carbon reinforced, fiberglass fuselage with carbon reinforced obechi - foam, pre-sheeted wings. A unique direct drive elevator servo is installed in the vertical fin.

Sky Hawk Attributes

- ✓ High aspect ratio wing
- ✓ "Swift" wing tip technology
- ✓ Thin airfoils at the wing tip
- ✓ Large control surfaces
- ✓ Large tail surfaces
- ✓ Long tail moment
- ✓ Exceptional performance
- ✓ Sleek lines and good looks
- ✓ Easy to handle
- ✓ Lots of room for radio gear

Specifications

Wing Span	116"
Weight	58 - 65 oz.
Airfoil - Root	SD 7037 or S7012
Airfoil - Tip	SD 7037 or S7012 - 8%
Wing Area	900 sq. in.
Wing Loading	9.5 - 10.5 oz./sq. ft.
Aspect Ratio	15:1

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VULCAN 2M

V-tail

Vucanistics:

Wing Span	78.73"
Weight	33 - 38 oz.
Airfoil (8 1/2%)	S7012
Wing Area	556.55 sq. in.
Wing Loading	9.25 oz./sq. ft.
Aspect Ratio	11.13:1
Average Wing Chord	7.07"

...Designed by Mark Allen

Pre-sheeted wings
Epoxy, high tek fuselage

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