

Ian McClain

#### THE VINTAGE SAILPLANE ASSOCIATION

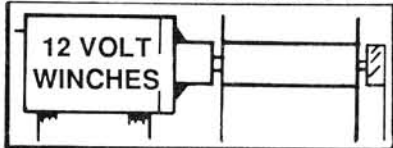
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Vol. 5 No. 3

March 1988



Photo by Lee Murray

# Wilshire Model Center



Bob Ratzlaff's Wilshire Model Center has a unique model for every soaring enthusiast. Strafe the slopes with JM Glascraft's 28" Pee Wee Penetrator, sail for the stratosphere with a stately European scale sailplane, or pick a great plane in between!

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HI START - GUEST EDITORIAL.....BEN TRAPNELL

(Editor's note: considerable response has been received in connection with recent "Hi Start" editorials concerning the relative merits of thermal duration, F3b, and cross-country flying. This is a first response, and there will be others. RCSD is pleased to relinquish the "Hi Start" space to such responses which will be of interest to all readers. Jim Gray.)

"Regarding the F3b vs. TD vs. F3h debate, I feel you made some valid points in your January article. I'd like to go one step further, though, and separate thermal duration from F3h. I've always enjoyed thermal duration and probably will continue to do so in the future. I feel, though, that F3h is going to outdistance TD in popularity as more people are exposed to the event.

"Thermal duration has become more of a landing contest as opposed to a flying contest. With the great number of people attending these contests, coupled with the desire to fly as many rounds as possible, the tasks have tended to become less challenging. Dave Darling, District X V.P. of the National Soaring Society, attended the Fall Soaring Festival in Visalia, California. After four rounds of flying (total flight time for four rounds added up to 25 minutes), his total was a perfect 25.00 minutes. To me, incredible flying! That, unfortunately, tied him for 92nd place! I mean, 92nd out of 159; now tell me that landings weren't the major factor in overall placing. I've had my share of 'perfect' landings and realize that they take great skill to master, and my hat's off to those who consistently do them well. When I attend a contest, though, I want to fly!

"F3b, on the other hand, seems to place a premium on design: strength and speed spoken here, folks. To compete, your design has to be ungodly fast, and completing the speed event in anything more than 20 seconds puts you in the minors! To accomplish this, your plane has to be the latest in technology--fresh off some guru's plotter--made with the most exotic materials the space program can dream up to keep them strong enough. Hey, they have to survive the 'ping' and 20 seconds of air time, don't they? What about the distance event? Again, a speed event. Unless things have changed, the working time is pretty short making it a 'how many laps can you do in a given time' affair.

Distance /Time = VELOCITY!

And the duration task...if you core a thermal, you're nearly assured a max. What about the expense? Forget the average modeler and his modest season's building budget. This event is for the pro's (read that the rich or the sponsored, folks).

"On the other hand, Corss-Country (F3h) seems to place a greater emphasis on piloting (read flying!) ability than either of the other two, combined with a fair amount of teamwork. Most cross-country events require a pilot to complete a specified distance, usually around a closed course. This is not always the case, as some events allow for flying the greatest distance in a straight line, while others use the cat's cradle as you mentioned. In any case, the pilot is required to find sufficient lift to make it as far as possible in one launch (the dash-and-crash events seem to be losing popularity these days). In nearly every instance, that means finding lift more than once! When to thermal and when to 'truck' becomes the strategy. Do you want to take the thermal just a bit higher, or take your chances that good lift will be available farther out on the course? When you're looking for lift, do you want to stay with others or strike out on your own? Sorta comes down to something of a chess match, doesn't it? Whereas F3b places a huge premium on design (speed and strength) cross-country lets the participants and their craft be somewhat more flexible (no pun intended). Granted, all things being equal (piloting skill, lift, etc.) the faster plane should win. But whwn are all things equal, really? A guy like Joe Wurts could show up with a brick and probably make us all look bad (and he has, too!) Regarding design, as one person so aptly put it concerning the Indy 500: 'You've got to compete to compete!' If the design doesn't allow you to stay in the air, you ain't gettin' no hardware! Your typical floater may have more business out on the course than a speed merchant! 1

"Now, when it comes to the amount of flying time you get, cross-country contests differ. A good CD will vary the course length to match prevailing conditions. If the conditions are great, the course may be lengthened. Bad conditions might require shortening the course. That's not to say that everyone is expected to complete the course. The task should be sufficiently tough to prevent the "automatic" finish. Contest participation has nothing to do with the task.

"The CD in Corpus Christi doesn't allow multiple launches on the course. If you don't complete the course, you may go back to the start and launch again... ASAP, if you so desire! What may not seem obvious at first is that the more you fly, the better your chances of posting a winning distance or time! Your leading distance (or time, if you were good enough to complete the course) is only the best however until someone goes a bit farther (or faster). Would you rather it be you or someone else? In past contests, to share the load, nearly every team has divided the flying duels amongst each member. Picture twenty-one some odd planes in the air at any one time flying as often as crew endurance allows...man, what a sight! Now, that's my idea of fun.

"Another nice thing about the current F3h rules is that they are provisional. Meaning? Hey, the contest can be nearly anything the CD would like! If you've got a way of improving the format, it's not written in stone. Go for it! As with any new event, however, it'll have to have its share of growing pains. In the end, though, cross-country should prove to be the most popular model soaring event on this, or any other, continent.

"Well, I know the above may contain too much 'opinion' and not enough pure fact...but I guess that's what editorials are all about."

Sincerely, Ben

Great Race photo by Lee Murray



X.C.Excitement from last summer's "Great Race". Team #10 (MUSA) passes the MTS team on the first Day. Team #10 went down shortly after.

Cover: Typical X.C.team launch. This one at the sod farm base camp of the Great Race. Lee Murray Photo.

**"R/C REPORT" Magazine, P.O. Box 1706, Huntsville, AL 35807**

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Re F3b or (subtitle) "You cawn't git they-ayah from hee-uh". In response to your question in the January Hi Start, except for thermal duration contests in Lincoln, Nebraska, I don't believe F3b sailplanes will 'make it' in AMA duration, although ships that look like them will always place high. Here's justification for my comment:

1. Winches that will give you a 250-Meter, F3b-style zoom launch are not usually available (...unless assisted by 30 mph Nebraska winds...);
2. The structure needed to withstand such launches will result in wing loadings higher than optimum for TD in light air...;
3. The small fuselage cross-sections suitable for max speed and distance tasks add to visibility problems (therefore also control problems) at thermalling ranges. This "see-ability" problem is not offset by the ease of returning clean, heavy F3b models from far downwind locations;
4. Superficial resemblances can disguise HUGE aerodynamic differences. For example, Terry Edmonds IO is as sleek and small-bodied as any F3b machine (in appearance) but - aerodynamically - floats like a Gentle Lady because of similar wing loadings;
5. Design adaptations favoring good F3b speed and distance performance conflict with maximum TD capabilities, and unless a lot more FAI speed and distance tasks show up in US meets, there is no reason to accept these compromises. An F3b ship and an optimum TD ship will have the same sink rate, but the TD ship will be only half as fast...meaning that it will take more time to get back from downwind, accumulating points all the while.

I agree with Bernard henwood's statement that Big IS BETTER, and believe that practical TD ships will find a practical span limit of about 12 feet, unless or until we or the AMA find larger sites for bigger sailplanes, or reduce spot landing bonuses. I expect TD sailplanes will become progressively cleaner, with concealed control horns, improved wing root fairings, emphasis on drag reduction, but not necessarily "pencil bombers". Just watch a Windsong soar, or look at the low drag achieved by a wide-bodied jet. "Gas bags" will probably always collect a lion's share of the prizes because there are so m any of them, and they are -relatively- easy to fly.

The light on the "Crystal Ball Computer" is beginning to blink, so let's close for now. Hope to see you soon.

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Ed's comment: Don, I wonder if possibly you have mistaken my meaning in that January editorial? I think I tried to get across the idea that F3b-like machines will probably do well in cross-country, not necessarily TD contests, although if you could see ships like Epsilon and similar world-class machines soar in thermals, I don't think you'd be willing to accept that they aren't TD soarers. On the contrary, they are really magnificent because of their aerodynamic refinement...which gets us back to the point you make so well: all future TD winners will probably be sleek and slim and streamlined. That, my friend, is the trend for TD, for F3h and for F3b.

"FAIA", a one-design "Olympic" Class Sailplane -- JIM GRAY

In the years between 1936 and 1940, a "one-design" class sailplane was conceived and built. Many of the countries of Europe where soaring was getting to be a BIG sport campaigned before the Olympic Committee for soaring to be admitted as an Olympic sport, just as sailing had been.

The sailing classes developed one-design boats in which individual performance, rather than design innovation, would determine the outcome. The class was to be affordable for any competitor and any country, and it was to have sufficient performance to be challenging for any competitor of any skill level.

The Polish ORLIK was one outcome of the design competition, and the German OLYMPIA, (Meise) was another. The Committee selected the Meise as the best design. It was by Hans Jacobs who also designed many other noteworthy sailplanes.

The soaring Olympics were never held in 1940 where Finland was to have been the venue, because the outbreak of World War II in 1939 foreclosed that possibility. After the war, there was no further effort to make soaring an Olympic sport, at least not enough to revive the idea.

However, in full-scale soaring, there was an effort to design a 15-meter span successor to the Olympia for World Championship (but not Olymppic) soaring. This became the 15-meter class, supposedly an affordable one-design class where span only was limited. Designers saw an opportunity to "bend the rules" and make a superior one-design, and the race was on. However, several designs were examined by the OSTIV committee of the FAI soaring committee, and again the Poles produced their FOKA or seal, as one of the entrants. The German Ka-6, however, was another and became famous for its handling qualities, relative low cost, ready availability, and overall performance. Other designs were submitted by France, England, and other European countries. The addition of flaps to the 15-meter class, and retractable landing gear were some of the developments that had not been originally intended. Thus, the 15-meter class fragmented into the racing class...and the race was on, in spite of several entries fulfilling the need.

Schweizer liked the idea of a one-design class of machine that virtually any pilot from any country could afford, and the 13-meter (40 foot) span 1-26 became the "horse" of that class. It was simple, easy to fly, had modest performance, and was so constrained that whatever one pilot might be able to do by way of modification (limited by the rules) would not make his machine any more or less competitive than any other. Thus the Schweizer 1-26 Design Class association was born, and still exists. They have their own "nationals" each year, and a soaring champion is selected -- a pilot who flies a One-Design 1-26.

I would like to propose an FAI one-design machine for "Olympic" or World Class RC soaring, and I'd like to call it the FAIA, or FAI -Aircraft design. It would meet all the rules for design limitation, whatever they might be. I suspect that it might possibly look a bit like the F3b sailplanes which have evolved to meet task requirements. The FAIA would be the result of a one-design contest which is set forth by agreement between countries. Maybe span, wing loading, airfoil and other constraints would be chosen. The resulting machine would be chosen from a fly-off of sailplanes between countries submitting their idea of the one-design sailplane built to the rules.

Once chosen, the FAIA would be built by any country from the same materials and to the same set of specs, with only minor deviations of an uncritical and unimportant nature allowed. These, then, would be in the hands of all pilots at the future "Olympic" contest. The outcome of the contest would be decided by the pilot, and not by money, not by technical break-throughs, not by any of the other deciding factors seen in today's "gold-platers". IT IS TIME FOR A ONE-DESIGN SAILPLANE CLASS WHEREBY CHAMPIONS ARE SELECTED BY PILOT ABILITY FLYING THE SAME SAILPLANE.

#### RC SCALE SAILPLANES in Southern California.....Video Review

Mark Foster, 326 Oneonta Drive, South Pasadena, California 91030, has put together a video (available on Beta or VHS) of slope soaring. There are over half a dozen different scale sailplanes shown, and all are 1/5th-scale or larger in size.

The video consists of nearly two hours of un-interrupted shots of scale sailplanes flying over several different beaches and cliffs in California from Ventura to Big Sur. You will see these sailplanes circling in the lift, skimming low over the edge of the slope, climbing and diving...all in majestic beauty.

Of the types shown, I particularly liked the Schweizer TG-2 done in the U.S. Army Air Force training colors of yellow and blue with red tail stripes. This machine soars superbly well, and looks very "different" compared with the others. There is also a very nice Ka-6 (or maybe two) that I also liked. As you can see, this reviewer's taste runs to vintage machines.

You will see an SB-10, an ASW-22, and ASW-20, an LS-4, a Schweizer 1-34, and many others that are listed in the screen credits at the end of the film. I shouldn't "spill the beans" about Mark Foster who made this video, but I will...as he is shown in one sequence with his ASW-20 which is really very funny. I won't say more, but it is nearly worth the price of the video all by itself.

Speaking of price, it is just under \$20. For the latest info, write to Mark about availability, etc.

#### .....Video Review

Incidentally, I have to say that in my opinion there is somewhat more repetitive footage than absolutely necessary, but in defense of that one can say that if you need detail for your own efforts you'll find plenty there. One other point: I did not always enjoy the musical background (being a dinosaur myself and not "tuned" to today's sounds) but I think anyone under 30 will love it! Some of the music pleased even me, however, so really beauty is in the eye (ear) of the beholder. Mark is a jazz musician.

Finally, I would very much like to have seen (heard) more descriptive narration concerning what kind of sailplane was being flown, who was doing the flying, where the site is located, and any interesting and specific details concerning the ship itself as well as the conditions for that day...wind, etc. Mind you, for the knowledgeable sailplane "buff" these things are mostly unnecessary, but for one who is looking for the first time these subtle nuances of experiences could well be missed without the descriptions.

All-in-all, a thoroughly enjoyable first effort, and one that should encourage Mark Foster to continue with his efforts. I think a good film editor would be helpful, but as it is, it's Worth Watching. JIM GRAY

#### POWER SCALE SLOPE SOARING:

#### PSSS ..... COVERING FOAM-CORE MODELS .....A TIP FROM ENGLAND

Cover with BROWN paper, using diluted aliphatic resin glue (Carpenter's Wood Glue).

#### Method:

1. Wet the paper so that it is pliable but not sopping. Place between two towels to remove excess water if necessary.
2. Dilute wood glue approximately 50 - 50 with water.
3. Coat surface of foam to be covered with diluted glue
4. Lay wetted paper over surface and smooth down with fingers or brush
5. Sand with 120 grit or finer after surface has dried hard and completely.
6. "Polish" with steel wool after sanding.
7. Apply automotive primer
8. Apply automotive lacquer from spray cans

#### Note:

It is best to apply brown paper only in areas where stiffness is required, regardless of weight...such as "D"-tube leading edges of wings, and on fuselage parts. Rear of wings, all of tail surfaces, should use JAPANESE TISSUE for lightness. and this can be applied by the same method. White glue may also be used.

#### Idea:

Use a paper towel or toilet paper cardboard tube as a center backbone for a foam jet model. Build the foam up on the tube, or sink the tube into a block of foam, or better still cut foam "formers" and slide them on the tube. Add stringers as needed, then cover with sheet foam sections over formers.

Take a toilet paper tube or similar and use as A MANDREL by covering with saran wrap, wax paper or similar. Cross-wind very light strips of paper on the tube and wet them in thinned epoxy, thinned white glue, or similar. Allow to dry. Remove from mandrel. You now have a very light-weight but strong tube that can be used for the basis of applying foam formers, etc.

Taken from the Newsletter of the Power Scale Slope Soaring Association, c/o Alan Hulme, 52 Mountway, Waverton, CHESTER, CH3 7QF, England, courtesy courtesy Ron Raymond, Bloomington, Indiana.

IS ANYTHING NEW UNDER THE SUN?.....Don Mulligan

(Well, there might be at that. The Sierra Vista Model Aviation Club - AMA 2259, will find out this coming June...on the 4th and 5th to be exact, and Don Mulligan wants to tell us about it. Ed.)

Most contests for sailplanes exclude powered craft, while powered model meets exclude sailplanes...and we think that both sides suffer because of it. We have an idea that just might possibly bring power-plane fliers and glider guiders together for a couple of days of fun, with the possibility of each learning something from the other. Here's what we have in mind.

**1ST ANNUAL RC DURATION CONTEST**

The meet will be held at our Ed Bollin model field at the Oscar Yrun Community Center in Sierra Vista, Arizona on 4th and 5th June 1988. The rules will conform to the AMA Rulebook, event # 702, with the following exceptions:

Paragraph 3.1: (Note: 1/2A area loading and max span deleted)  
"Engine Classes: Class 1/2A per AMA 3., 3.1, 3.2  
Class A 0.051 - 0.100 cu. in.  
Class B 0.101 - 0.200 cu. in.  
Class C 0.201 cu. in. and over

(For Classes A, B, and C)

Paragraph 3.2: "No propeller diameter restriction."

Paragraph 3.3 Replaced with - "Minimum model weight shall not be less than 200 ounces per cubic inch of engine displacement."

Paragraph 3.4: Deleted and replaced by - "Engine run shall not exceed 15 seconds from hand launch, or 20 seconds following release for unassisted ROG.

(For ALL Classes)

Paragraph 6.1: Max flight time to be changed as follows: - "Maximum flight time shall be 7 minutes, scored one point per second up to 7 minutes, and less one point for each second above 7 minutes."

Paragraph 6.2 deleted

Paragraph 7. Deleted/altered. Scoring is defined in Paragraph 6.1

Now, maybe you begin to see what we're going to try to do. After the power model launches, its engine shuts down and it becomes a glider.

You'll also note that gliders per se are not excluded...and may be powered for launching, just like the more usual power planes...or they may be launched by the usual means.

Many of us have seen some beautiful free-flight duration times put up by the likes of a Goldberg SAILPLANE, so it isn't really unfair for the power model to be flown in a contest with a glider or sailplane, provided the engine is used only for launch. It should be a lot of fun for all concerned, and -after all- 7 minutes is really quite achievable by almost any model that's not a flying brick, whether you call it a sailplane or a power plane.

If you're interested, and think you might want to try this, why not call the following points of contact:

Don Mulligan, 931 Cactus Wren Lane, Sierra Vista, AZ 85635; (602)458-7677, or Lou Crane, 2163 Sonocita Drive, Sierra Vista, AZ 85635; (602)459-0546  
See you there?

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NEWS AND VIEWS

PAUL CARLSON of OFF THE GROUND MODELS HAS A NEW SAILPLANE TO BE AVAILABLE SOON! Paul's new ship is called the QUASOAR, and it ought to be available in April or thereabouts. It's controls include flaps, stabilizer and rudder (no ailerons) and it's a polyhedral beauty (see picture). The span is 123" for Open Class events; the weight is 64 ounces - a hefty four pounds ready to fly; Wing area is 942 Sq.In.,

and the fuselage is fiberglass -- wings are foam cored -- and tail is built-up. The airfoil is the well-known and respected Selig S4061 - a newer and improved 'foil compared with some of his original ones. There is a clear canopy that comes with the kit, ready to be tinted your favorite canopy color. In a way, this beauty is reminiscent of an enlarged Prodigy, streamlined and improved, with contemporary materials and construction for strength and fast building. Price as yet is unannounced, but it is bound to be competitive. Ask your local hobby shop, but - failing that - you can always get in touch with Mr. Prodigy himself, Paul Carlson, at P.O. Box 518, Lawrenceville, IL 62439. AS for myself, I want one!  
oooooooooooo



BEAUTY AND THE, ER -- AH, BEAUTY! LOVELY MODEL HOLDS THE PROTOTYPE OF OFF THE GROUND MODELS NEW QUASOAR, AN UNLIMITED CLASS SAILPLANE. PAUL CARLSON SAYS IT WILL BE AVAILABLE ABOUT APRIL OF 1988. SHIP IN PHOTO HAS WHITE COVERING, RED AND ORANGE STRIPES ON WING AND TAIL, AND DARK BLUE CANOPY. OUTSTANDING!

F3b for X-C? .....Don Winiiecki ^

Don writes a fascinating letter, and has some great ideas. His address is \* 161 Stewart Avenue, Buffalo, NY 14211. In a letter received a few days ago, Don responds to one of the HI START editorials about the suitability of F3b-type sailplanes for cross-country events. Here's Don.

"With several modifications, I agree with you that it (an F3b design) is the best possible ship...because of its similarity in design to full-scale racers with the added advantage of avoiding the necessity of designing a fuselage with a pilot in mind & the integral effect of a fuselage/airfoil shape causing stall characteristics to change on the violent side. Granted, this only comes into play in extreme cases, but at very high altitudes reached in X-C events, the pilot's ability to 'make' the attitude of his aircraft is sometimes only an educated guess.

"The better roll control afforded by ailerons & flaps is certainly necessary, along with the variable camber capabilities that only cause problems with rudder/elevator polyhedral ships. The design strength of F3b designs is also a plus. The stresses handled in speed and distance tasks would have a better chance to survive the apparent microburst (my theory) that destroyed Larry Jolly's plane two years in a row at the Western Great Race (ref. November '87 Model Builder, p.35). Also, because of the

NEWS AND VIEWS (Continued):

aforementioned altitudes, a gyro or other electrostatic-type stabilizer would be of benefit, as would be the addition of a thermal sensor. As a sidelight, the type of guidance system described in your January '88 issue (ref. p. 23) would tend to minimize the pilkot skill in locating and using thermals. It is a fine piece of equipment, but it would tend to eliminate the skill required to succeed in contests as the plane does the thinking for you!

Lastly, the airfoil shape in an F3b should have a sharp leading edge for the speed task. IN an X-C, perhaps the N.A.S.A. leading-edge droop would provide the combination of a gentle stall and speed. To try to summarize this rather jumbled monologue:

1. Inherent clean design for (a) speed in X-C, and (b) thermalling @ lo speed;
2. Better control afforded by (a) variable camber for (i) speed in X-C and (ii) thermal efficiency;
3. Strength of design to survive (a) invisible micrometeorology events and (b) extremely fast downhill final glide;
4. Slightly different airfoil section for different  $\psi$ pe of task;
5. The versatility built into F3b designs: (a) speed, (b) thermalling ability, and (c) modification for greater inherent stability.

With the addition of a thermal sensor (variometer in full-size sailplanes and a gyro to help the pilot be "in" the plane -- perhaps aided by polyhedral) an F3b-type ship seems to be close to the ultimate X-C design. Maybe Bob Dodgson has it now???

"Hold it: I am looking at a photo of the F3b Champion's ship -- an EPSILON, on page 89 of the November '87 Model Aviation -- it appears to have some polyhedral. Would this provide the stability of the gyro I am suggesting? Here's another example of German ingenuity.

"Another topic needing attention for cross-country machines is that of visibility. The white glass in full-scale ships would be very difficult to see in a model at altitude (although many F3b's stick with white on top surfaces with red or black lower surfaces). White seems to be necessary for the 'life' of the fiberglass because of the heat buildup caused by the sun's rays on a darker surface, and the Ultraviolet light effect on the material. Anyway, I'm conducting my own experiments with these design considerations, and hope to be able to tell you more soon."



C 5 Team Sailplane being assembled (Sagitta XC) C 5 = Chicagoland Cross-country Cruising Corporation. Great Race Photo by Lee Murray.

THE MYTH OF THE INANIMATE OBJECT.....Pancho Morris

We were taught in elementary school that there are two basic types of objects: animate and inanimate. Animate objects were those that could think to some extent, move, have some control or effect on themselves and/or their surroundings. Inanimate objects are just the opposite: they cannot think, move, or in any way affect themselves or their surroundings.

Those of us who are modelers know that this is a MYTH, a joke, a pile of atuff. THERE AIN'T NO SUCH THING AS AN INANIMATE OBJECT! EVERYTHING KNOWS! How else could all those things that happen to us happen?

Look around you on your workbench. How does that X-acto knife know to roll off the table and stick in your foot when you carefully placed it in the middle of the bench? How can that screw or small part you set down in the open disappear from the face of the earth? There wasn't even a puff of smoke like you see at a magic show!

Glue bottles are another good example. I feel that these are actually a result of the "inanimate object myth" and extremely high-powered engineering. I am convinced that there are high-powered engineers who are paid enormous sums of money to design glue bottles that will fall over on their own. How else could that glue bottle that you carefully put down be lying on its side in a puddle of glue the next time you look for it?

Transporting your model is a good time to look for "inanimate objects". How does a door jamb move a whole foot to catch the stab of your plane when you are carrying it into or out of the shop? Why does the hatchback on your car suddenly slam down on your pride and joy when you are loading the car on the morning of the State Championships? It's amazing how the latch on your toolbox always comes undone when you are ready to pick it up!

The weather! We all know about the weather...the ancients were right. They knew that the wind and the rain and the sun were all living beings. How does the weather know which day of the week is Sunday and which is Monday? How can it know when you take a week off from work? It always knows which weekend is your big annual meet.

We've all had innumerable experiences with so-called "inanimate objects." So, the next time your electric drill jumps off the bench and goes through the wing of your almost-completed new world beater, remember: "THERE AIN'T NO SUCH THING AS AN INANIMATE OBJECT. EVERYTHING KNOWS HOW TO BEAT YOU -- AND IT WILL!"  
oooooooo

Editor's comment: Pancho, you've got a point, but I think I have an explanation.

Do you recall the GREMLINS that used to plague WWII pilots? Everyone remembers gremlins, and their female counterparts FIFINELLAS! How come the throttle of your was full on when you KNOW that it was only cracked...and you went out to pull the prop through a couple of times and the switch was "hot" instead of off? Gremlins, that's how; they actually came into the cockpit from somewhere back in the fuselage when you weren't looking, and moved those controls to the position that would do the most damage. Well, after the war there were an awful lot of unemployed gremlins. They got tired of living in the desert near Tucson with all those abandoned and "mothballed" aircraft. Thousands of them, with never a pilot or crew member to plague or play nasty little jokes on...and they got lonely. With private aviation in such a dilemma, and factories hardly turning out any general aviation planes, there were still fewer pilots to play jokes on...and you know that gremlins bother only pilots and airmen. Where could they turn? NOW, we KNOW where they turned. Thousands upon thousands of modelbuilders and pilots of gliders, helicopters, power planes of all kinds. The Gremlins came swarming out of all those abandoned planes and scattered about the country, seeking out every modeler, every flying field, every club meeting and gathering place of pilots and their models. They gleefully put burnt-out glow plugs in field boxes; they splintered perfectly good props, they stole tools and springs and nuts and bolts -- but not pairs -- oh no! They stole single bolts and nuts -- so you are left with unmatched parts. It goes on and on...and they occupy inanimate objects as their comfortable homes. GREMLINS! There's your answer Pancho, and it explains everything. BELIEVE it, 'cause it's true.

Michael Selig  
Penn State  
Dept. of Aerospace Eng.  
233 Hammond Bldg.  
University Park, PA 16802 USA  
(814) 865-9611

John Donovan  
Princeton University  
Dept. of Mech. and Aero. Eng.  
Engineering Quadrangle  
Princeton, NJ 08544 USA  
(609) 452-5379

#### Progress on the Princeton Low Reynolds Number Airfoil Tests

At this stage we have all the instrumentation and supporting equipment to run the experiments. The lift on the model will be measured by a specially designed one-component force balance. The drag will be measured by the 'wake rake' method which will involve traversing the airfoil wake with a single miniature total head pressure probe. Other measurements will include the angle of attack, the freestream dynamic pressure and static pressure upstream and downstream of the model. Each of these quantities (as well as others) will be digitized through a 12-bit A/D converter connected to an IBM PC/XT for data storage and analysis. A more thorough description of the experimental apparatus and procedure will be given in Soartech which will follow the experiments.

Sometime in February we plan to begin installing the system into the wind tunnel. We have not been successful at predicting when work on the tests will begin or end; however, it is clear that the experiments will have to be finished by August 1988 since Michael Selig finished at Princeton last August and since John Donovan will finish sometime in August 1988.

As listed below we have 12 wind tunnel models built and 7 currently under construction.

#### Wind Tunnel Models Completed & Builder

CLARK-Y	Stan Watson (IL)
E193	Stan Koch (TN)
E214	Terry Luckenbach (PA)
S4061	Forrest Miller (NJ)
E387	Forrest Miller
E387	Bob Champine (VA)
S3021	Bob Champine
S4233	Bob Champine
MB253515	Mike Bame & Jerry Krainock (CA)
WB 135/35	Woody Blanchard (VA)
WB 140/35	Woody Blanchard
S2091	Dave Jones, Bruce Baker, Mike Chiddick, Roger Egginton, & Les Roger (England)

#### Wind Tunnel Models under Construction & Builder

S4061	Mark Allen (CA)
E214	Tyson Sawyer (NH)
E205	Dave Batey & Company (WI)
HQ1.5/9.0	Rolf Girsberger & Company (Switzerland)
HQ2.5/9.0	Ray Olsen and Company (AZ)
S4064	Stan Watson (IL)
FX10-100	Rich Border (NJ)

We have duplicates of some airfoils so that we can check the possible degree of performance variability between different models. After we start testing some of these models, we still plan to design new airfoils and have them built and tested. Given that we have to end by August 1988, however, we may not be able to do all that we wanted.

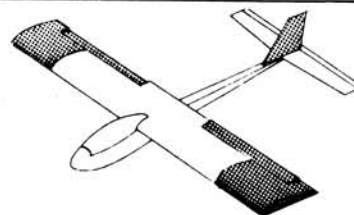
We are very thankful to the large number of people who have contributed to the project and continue to support it. The following excerpt is taken from our last progress report (4-15-87):

At this point, the entire measurement system has received considerable improvement thanks to large contributions of time, money, and equipment from David Fraser (Fraser-Volpe Corp., PA), Prof. A.J. Smits, Prof. S.H. Lam, and Prof. H.C. Curtiss (Princeton University), Ray Olsen (AZ), Prof. M.D. Maughmer (Penn State), H.A. Stokely (Soartech), MKS Instruments (MA), and Scientific Solutions Inc. (OH). We have also received help from Lee Murray (WI), Doug Dorton (UT), Prof. Mark Drela (M.I.T.) and Preben Norholm (Denmark).

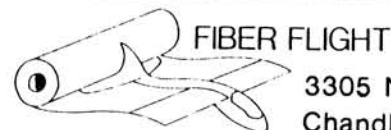
We have had an overwhelming response from our initial letter asking for help in building wind tunnel models. So far, the following people have offered to build models for us: Chuck Anderson (TN), Mark Allen (CA), Jerry Arana (CA), Mike Bame & Jerry Krainock (CA), Ken Bates & Ken Shaw (MI), David Batey & Company (WI), Tony Beck (VA), Woody Blanchard (VA), Rich Border (NJ), Ron Carter (UT), Jack Cash (MD), Bob Champine (VA), Bart Como (TX), Seth Dawson & Company (CA), David Fraser and Company (PA), Rolf Girsberger and Company (Switzerland), Duane Harris (IA), Peter Illick (CO), Dave Jones and Company (England), Stan Koch (TN), Terry Luckenbach (PA), Harley Michaelis (WA), Forrest Miller (NJ), Carl Mohs (MI), Mark Nankivil and Company (MO), Ted Off (CA), Ray Olsen and Company (AZ), R.J. Ostrander (NJ), Tom Pratt (OH), Mike Reed (CA), Joe Ruminski (NC), Tyson Sawyer (NH), Gordon Stratton (NY), Doug Stout (NJ), Jeff Troy (VA), and Stan Watson (IL).

Over the last several months Jerry Jackson (TX), Armin Saxer (Switzerland), Chuck Griswold (CA), H.J. Rogers (OH), Brian P. Smith (OH), Tom Yamokoski (OH), Trey Wood (AL), Karl Widiner (CA), and Todd Enlund (LA) have also helped us, either by making contributions or offering to build wind tunnel models. We hope no one has been left out.

When we begin taking measurements we will be sure to let you know. Thanks



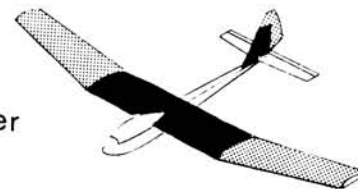
**INDEX ONE**  
**SLOPE SHIP**  
48" wing span  
Aileron / elev.  
Fully aerobatic  
\$30.00 + \$4 S & H



**FIBER FLIGHT**  
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Chandler, Az. 85224

#### **INDEXEM** **SAILPLANE**

78" wing span  
Rudder / elev.  
Thermal floater / trainer  
\$35.00 + \$4 S & H



COMPLETE INSTRUCTIONS  
602 · 838 · 8921

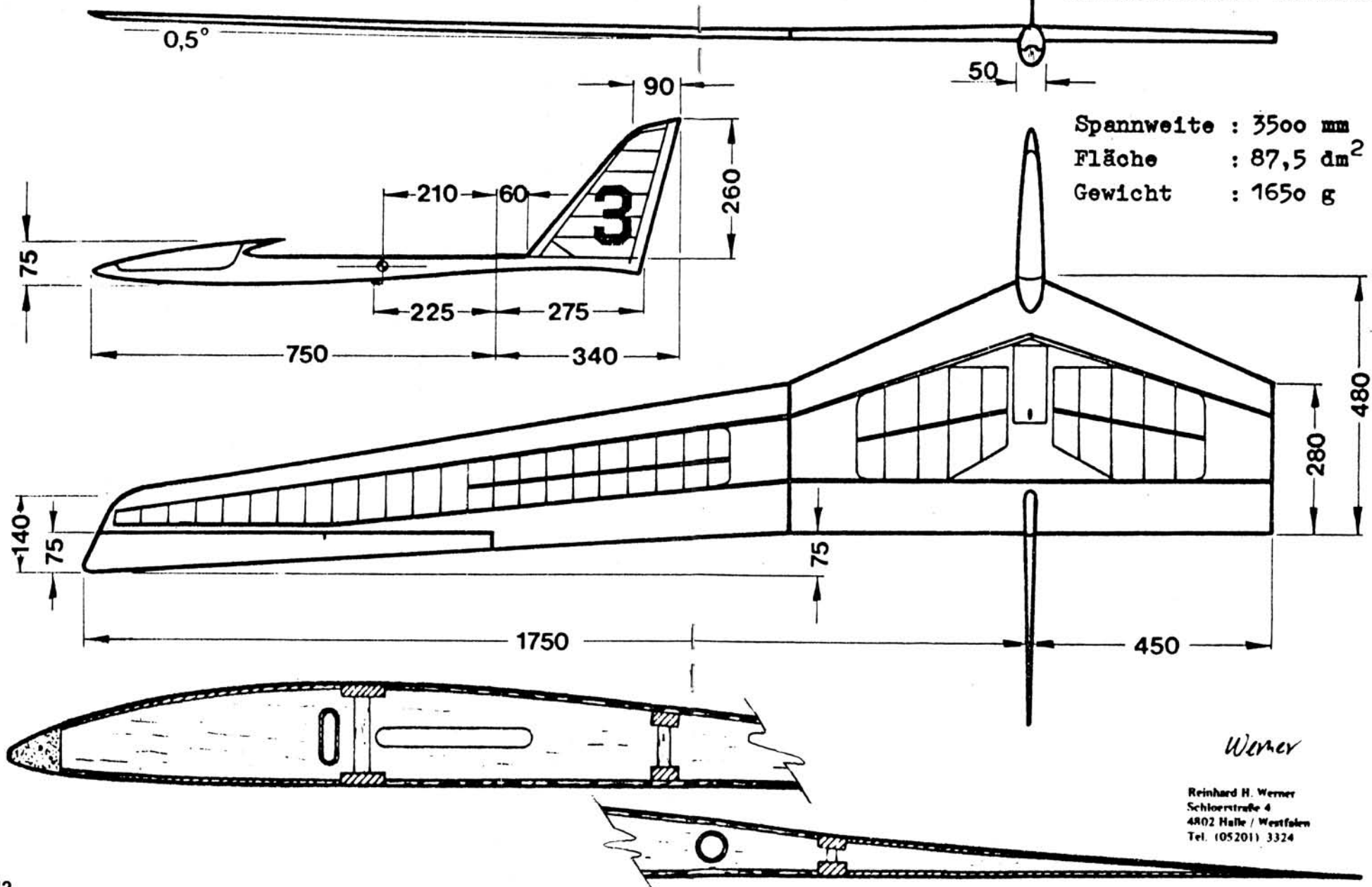
ALL HDWE. & COVERING INCL.  
602 · 821 · 0517

# Eureka

Flying Wing by Reinhard Werner

This well drawn 3-View comes to us from Germany by way of New Zealand. Thanks to the New Zealand Soaring Society Newsletter and Reinhard. We won't bother to translate so that our readers can practise their German.

Streckung : 14  
 5° Schränkung  
 im Außenflügel  
 elektronischer Mischer





Introduction: Well' at last it has happened! RCSD received a manuscript from an honest-to-goodness professional woodworker who is also a modeler par excellence. Asher Carmichael hails from Daphne, Alabama. He's been model building in some form or fashion for 30 years, and actively building and flying gliders for about 3 years. He is presently Design and Product Engineer for Emperor Clock Company, and has the responsibility for achieving good, consistent results in connection with building...jigs, techniques and methods. He claims that his aesthetic sense is more applicable to furniture than models...but don't you believe it! Just wait and see... RCSD hopes that you will enjoy and use the information in Asher's first article presented herewith. If you do like it and want more, write or call and let me know...and you can help me twist his arm to become a regular contributor and columnist. JHG.

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Like it or not, hours of work go into a sailplane before it flies. Presented with a box of machined or die-cut balsa, plywood, fiberglass, foam and a set of plans and instructions, we have to identify or make the pieces, interpret the plans and assemble the parts into a flying machine. Simple? Well, yes and no.

The simplicity depends on the quality of the kit, the clarity of the instructions, and - above all - the ability (patience, determination, ingenuity) of the modeler. This "ability", more than anything else, whether that new high-performance sailplane will be a jewel or an "also ran".

For one, I enjoy the madness...okay, I confess...the obsession! Some people laugh at the time and energy I put into a 'plane, but it really isn't all that much (don't ask my family!). I just can't help it because I was raised that way. My parents taught me that if anything is worth doing, it's worth doing your best...enough justification for me. All that remains is to convince myself that it's really worth doing. After 30 years of model building I know what my best is, and how to sweat over trying to achieve it.

We're all looking for ways to avoid frustration and some of that sweat, and if there's an easier way to accomplish the goal we'll adopt it. It's really fun to receive and share new-found techniques, and I think all soaring enthusiasts can benefit from such an exchange... and I'd welcome hearing from you about what you have discovered or adopted to make your building easier or better. After 30 years, I'm still learning, and would be happier than an Alabama buzzard in good lift to hear from you!

#### Building Surfaces:

Most of our time and attention is making sure that the airframe is straight and true...think about it...all of that cutting, fitting, sanding, and gluing are the means by which we match up a set of parts to form a warp-free and straight structure. Any device, technique, method or jig to help us to that end is heartily welcomed, right?

The building surface, most often a building board, is a jig and your primary reference for a straight, true assembly. It must be straight as well as flat in all directions: side-to-side, end-to-end, and corner-to-corner. Please note that it doesn't have to be level! A flat building surface is the key to repeatable, consistent building results. Okay, how do we obtain such a necessary building surface? I've tried hollow-ware doors on saw horses or ceiling tile on my workbench...even balsa and soft wood boards...but as sure as sink follows lift, all of them warp sooner or later; that's a fact! If you insist on building on these surfaces, the best advice I can offer is to make sure you have the flattest surface you can obtain and check frequently to keep it that way. You can check this with another "jig" - a straight-edge. Twist can be seen with "sighting sticks" in the same manner you can see twist on a finished wing. Get two warp-free and equal-sized sticks that span the width of the board. Place them across the surface, perpendicular to the long edge, at the ends as well as at intervals from end to end. Sight along the sticks at their level to see if they are parallel. If not, adjust the board with shims and/or clamps until the surface (board) is as flat as possible.

#### My Building Surface:

Presently, I use a piece of medium-density fiberboard 80" long, 14" wide, and 1½" thick. It is surfaced on both sides with high-pressure laminate (kitchen counter-top surface material). The board is heavy, flat, stable, and - possibly - hard to get. As an alternative, take two pieces of kitchen counter-top and glue them together, back-to-back. The reason for this is to insure that opposite surfaces

of your board are the same material to prevent warping from temperature and moisture changes in the air.

#### The "Best" Building Surface:

Possibly the best building surface of all is a piece of plate glass, 3/8" thick...not cheap, but readily available and well worth the price. This is, without doubt, the flattest most stable surface you can get, but - for safety's sake - make sure the edges are polished or sanded...something that can be done by your glass supplier when you purchase it. If you think that 3/8" is too thick and heavy for you to manager, you can always settle for 1/4" plate glass which will be nearly as good. You can have it cut to dimensions of your choice, and not necessarily the size of my board. Get what's best for you.

#### Using The Glass "Board":

I knew you'd ask: how do you pin work to these impenetrable surfaces? Answer: you don't! One of the great but unheralded advances in construction, comparable with composites and cyanoacrylate glue or iron-on covering, is spray contact adhesive (such as 3M Spray 77, trademark of Minnesota Mining and Manufacturing Company). This material provides permanent bonds for sheeting foam wings, and it also provides one of the best temporary "clamps" of holding devices available!

Spray both mating surfaces of an object to be joined, and a permanent bond is formed. Lightly mist one surface, wait a few minutes, assemble the pieces, and a temporary bond is achieved. The correct amount for either application is quickly determined by a little experimentation. After learning of this adhesive in a Hot Stuff™ video, I have been using it for temporary and permanent bonds.

Conventional wings are built as follows: lightly spray the building surface ( in my case, laminated fiber board...but glass, if you go that route) with a quick swipe from a distance of about 18" - 24"... that's enough. Lay the plans onto this surface and smooth them out. Spray plan lightly and overlay with waxed paper. Now, spray the waxed paper, and you are ready to begin laying out the kit parts: sheeting, trailing edge, spars, leading edge, etc. A note of caution: if you are building a semi-symmetrical wing (Eppler 205, etc. with pronounced "Philips entry") then be sure to mask or cover the waxed paper from the spar forward so that when you spray, the paper won't be covered in this area. This will permit you to curl the bottom "D"-tube sheeting up to meet the leading edge when the time comes. Otherwise, it sticks to the waxed paper. If you wish, you can also lightly mist the trailing edge, the spar, and leading edge sheeting to hold them while you "zap" them together. **The spray adhesive is completely compatible with CA glue.**

Continue the wing in the conventional manner. When you are ready remove it from the plan, lift up the root and slide a thin ruler between the plans and the waxed paper..."walking the ruler along between them...and the wing will pop off the paper, which may then be removed easily from the bottom of the wing where it may have stuck. Any residue of adhesive on balsa, foam or building surface may be removed by a cloth dampened with mineral spirits.

Complete the wing as required. You may even find yourself "3M-ing" the framework onto the surface at various intervals such as top sheeting, forming the leading edge, etc. You need not use waxed paper between the wing and building surface every time, but it is good insurance until you become familiar with the characteristics of the adhesive.

#### Uses of Spray Adhesive:

The uses of spray adhesive are limited only by your imagination. I have used it for adhering bond paper or other pattern material to wood for permanent or one-time templates (depending on how light or heavy the spray application, and whether you spray only one or both pieces, as we discussed before).

You can attach rib blanks to each other for scratch-building, and also attach root and tip templates to the ends of the rib pack, but be sure you spray only one mating surface of each pair of blanks, otherwise you won't get them apart again!

You can also attach rib templates to ends of foam core blanks for hot-wire cutting airfoil profiles into the blank.

RAZOR'S EDGE (Continued).....Asher Carmichael

Uses, continued:

You can use it for fiberglassing wings or fuselages by merely spraying a light mist on the balsa, or on the cloth, and it will hold the cloth against the balsa structure. It is easier to spray the structure first and then apply the cloth, which may then be pulled, stretched or molded around unbelievable shapes. You may apply epoxy or polyester resin without fear of the cloth moving or bunching up. Along this line, another neat trick is to "resin" the cloth with CA.

You can sand mating parts using the 3M spray technique. The next time you have to sand that spruce leading edge or plywood root rib, try this: mist one side of a sheet of waxed paper and apply it along the joint between the balsa sheeting and the "hard" material. Sand to your heart's content, and the waxed paper will protect the softer balsa or at least let you know when you are levelling out. Then, remove the waxed paper for sanding that last thousandth of an inch.

You can hold your foam cores in their cradle when sheeting by using the adhesive to hold the cores in place and hold the beds to your building surface. There won't be any question about whether the air-foil is flat and true in the cradle.

You can hold balsa or any part for cutting, sanding or machining, because a light mist on the hard surface will keep small parts in place for intricate cuts. It will also hold parts in jigs.

You can make jigs for sanding (see next month's issue ... JHG.) and, of course, attaching sandpaper to almost any size or shape of sanding block.

Finally, I'd suggest that you think of spray adhesive as a clamp or holding device as well as a permanent bonding medium. I think you will discover that you can come up with virtually endless ideas for its use, and soon it will become a permanent part of your bag of tricks.

No, I don't own any 3M stock, but sure wish I did when the buying spree starts! See you next month.

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Editor's Comments:

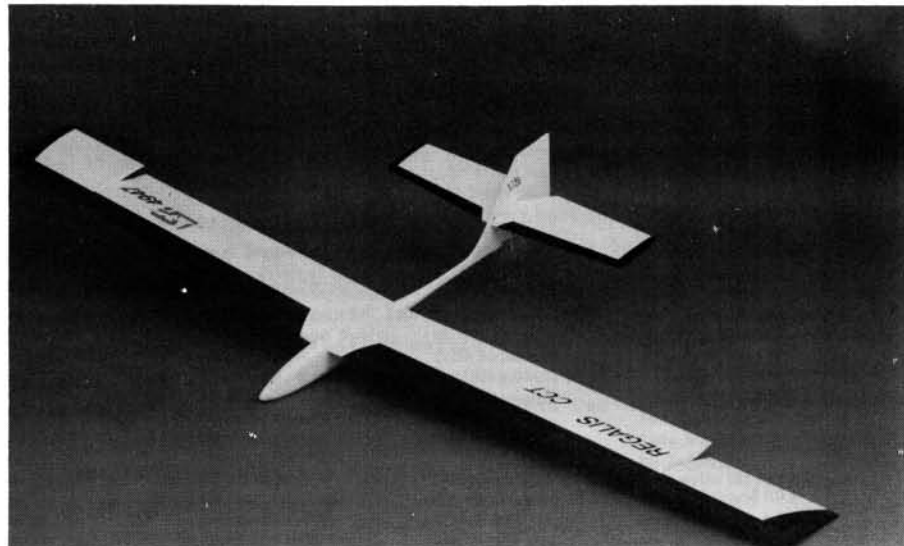
Asher Carmichael is a professional woodworker who has a great deal of experience cutting and finishing wood of all kinds, and constructing things like clock cases, furniture, and...yes...sailplanes. He has started a column for RCSD with this, his first article in a series that is expected to appear each month. He says that the use of simple jigs not only insures accuracy but also speeds up the building process. If you have any questions for Asher, you may write to him directly, or address your questions to him through RCSD. In case you wish to correspond directly (to save time) Asher's address is: 106 Pineview Court, Daphne, Alabama 36526.

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NEW PRODUCT ANNOUNCEMENT.....THE REGALIS CCT

Just before Christmas, RCSD received a letter and some photos from Jeff Morton at CALSOAR -- California Soaring Products -- P.O. Box 367, Topanga, California 90290; telephone (213) 455-2808. The letter contained photographs and a description of CALSOAR's long-awaited mate to the Accipiter CCT -- the **REGALIS CCT** -- A 100"-span version of the earlier sailplane. The new ship is also TIPPERON controlled; that is, the entire wing tip pivots about a axis parallel to the spar. This feature has proven to be an improvement over conventional ailerons, and provides almost instant response to control inputs. So successful, in fact, that it has been adopted for the REGALIS. Some of the "specs" include: a wing area of 918 square inches, aspect ratio 10.9:1, and a wing loading of 11 oz./sq./ft. REGALIS sports an Eppler 214 airfoil, and the wing has flaps which reflex 6° negative and 80° positive. The control functions include tipperons, rudder, stabilator and flaps. The tipperons are coupled to rudder and the flaps are coupled to stabilator. The wings and stabilator are foam core with balsa sheeting, and the

rudder is of built-up construction. The fuselage is epoxy-glass layup. REGALIS is said to have a "forever" glide, and is equally at home on the slope or in a thermal. Turns are flat with no skidding. The test pilot said: "It flies as if it's on rails, very solid and smooth, yet with a buoyant feel...like a solid floater. Much like ACCIPITER, the speed range is exceptionally wide, but REGALIS can be flown more slowly and she can turn very flat with little skidding or sink. This came as a most pleasant surprise. Launches are quite steep on a high start, and winch launches ought to be very high. Control response is excellent in all functions, and the only surprises are pleasant ones. I think the REGALIS will prove to be a very successful competition machine in the hands of a good multi-channel pilot, and what I DO know for sure is that testing and sport flying the REGALIS has been the most enjoyable flying experience to date!"



THINGS YOU CAN'T DO WITHOUT -- A SUPERB MAGAZINE.....Jim Gray

During the course of a month, I get a lot of inquiries about plans: where can I buy plans for XYZ, or ABC. Who has plans for winches or for electric power sailplanes or for scale sailplanes? Well, dear readers, let me tell you about a **SOURCE for plans** and a heck of a lot more. It is a magazine - a German magazine - and it looks expensive, but when you figure out what you get for your bucks, it's a steal.

The name of the magazine is Flug und Modelltechnik, published by Verlag für Technik und Handwerk, 7570 Baden-Baden, Postfach 1128, West Germany. Each issue contains subject matter of interest to all of us. It is NOT strictly a glider magazine, but each issue always has two or more sailplane articles. One of the best features is a **2/3 -size set of plans in each issue, and one of them is always a sailplane!**

Another excellent feature is the availability of **hundreds of plans at reasonable prices**.

O h y e s . . . I a l m o s t f o r g o t : Each plan that is included in every issue is the **subject of an article in that issue**. All you need to know: materials lists, photographs, construction details, etc.

are there. True, you do need to know a few German words to get along, but not that many, really. You can buy the full-size plan set from FMT.

In the latest issue just received, I found an article and 2/3 -size plan for a twist-wing or pivot-wing glider with vee tail, called "Colours S-2". It's a 2-meter, weighing a bit over 2 pounds, and features the pivot wing which controls **pitch and roll**. A complete materials list is furnished, down to the last tiny screw and stick. A beautifully simple linkage - shown in detail. Many black and white photos, comments and helpful flying hints...all there for you. Okay, that's the glider so what else?

Well, I've always wanted to build a scale Lockheed VEGA, and there is an article about building one, with documentation! A three-view and two air-brushed side views in black & white, showing Amelia Earhart's "little Red Bus" and Wiley Post's "Winnie Mae".

Then comes a full heavy-paper stock sheet of full-size airfoils: the Girsberger RG-12 and 2195 profiles, plus co-ordinate data and a few particulars about performance.

Next come two test reports: One on the ASW-24 and one on the MFT-400 "Lenticularis".

For the technically inclined there is a fantastic article about practical turbulation of a wing for model sailplanes by "blowing" air over selected portions of the surface. The model example is an electric glider with details. How about a model hot-air balloon? It's there, with photos and an article. Two articles on radios: one a test report, and another on How-to build a signal-seeker for a downed model. Sure, it's got ALL you need: pictures, drawings, schematics, and parts layout and lists.

Well, I haven't even covered HALF of the magazine's contents. It's a slick, four-color effort, perfect-bound on heavy, quality paper and good old German quality printing. COST: 78 Deutschmarks per year -- which is probably pretty close to \$40, and well worth every penny. GET A SUBSCRIPTION, AND PLEASE TELL THEM THAT RC SOARING DIGEST TOLD YOU ABOUT IT.

THINGS YOU NEED AND FIND USEFUL .....an RCSD Data Base

Many of you have written to me asking for the whereabouts of a certain article, bit of information, or sailplane offer. At last, you have a chance to get all this information, neatly characterized, in a data base -- all your very own, on disc. **Lee Murray, 1300 Bay Ridge Road, Appleton, WI 54911** has an **up-to-date RCSD data base** available at a reasonable price. This is on Apple Disc, and those of you who have Apple computers can availa yourself of this valuable aid to finding what you need in back issues. The data base is current through the December 1987 issue. A condensed version will be published periodically C'mon, guys - no pun intended!) in RCSD. Lee also may place the data base on IBM PC or IBM PC clone discs for those who have IBMs or clones. Ask Lee about this when you write. For those who'd like to call, Lee may be reached at: (414) 731-4848.

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Report: Key Word

Key Words-

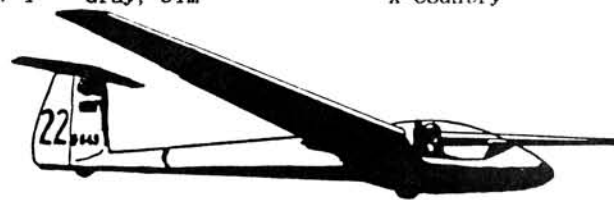
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Building Supplies	Aircraft Spruce & Specialty	-	-	800-824-1930
Building Supplies	Dick Edmond's Model Supplies	Unit 20, Vernon Buildings	Westbourne St., High Wycom	-
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Building Supplies, Composite Ma	Model Research Labs	24692 Muqha	Mission Viejo, CA 92691	-
Building Supplies, Soaring Supp	McCann Tool & Electronics	P.O. Box 8155	Stockton, CA 95208	-
Composite Materials	Aerospace Composite Products	Dept. S, P.O. Box 16621	Irvine, CA 92714	-
Composite Materials	Bob Violett Models	1373 Citrus Rd.	Winter Springs, FL 32708	305-365-5869
Composite Materials, References	Dupont Composites Div.	Chestnut Run, CR702	Wilmington, DE 19898	-
Electronics	Ben Thomas	1740 Aberdeen Terrace	Winston-Salem, NC 27103	919-923-0824
Electronics	High Sky	3929 Kansas Street #9	San Diego, CA 92104	-
Electronics	Pelican Enterprises, Inc.	265 Oxford La.	Bloomington, IL 60108	-
FG Fuselages, Kits	Sealy's Quality Fiberglass	521 96th. Lane N.E.	Blaine, MN 55434	612-780-2737
Foam Wings	Competition Products	921 Birdie Way	Apollo Beach, FL 33570	(813) 645-51
Foam Wings	Salesman Models	58 George St.	Saltire, Shipley, W. York	-
Foam Wings	Precision Foam Cores	850 Concord Street	Pleasanton, CA 94566	415-462-0672
Kits	AMS Import/Export	1110 S. Wells Ave.	Reno, Nevada 89502	702-786-7733
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Kits	British Assoc. of RC Soarers	6. Stringwell, 17 Hepley Ro	Mr. Stockport, Cheshire, E	-
Kits	California Soaring Products	P.O. Box 367	Topanga, CA 90290	213-455-2808
Kits	Chris Foss Designs	448 Upper Shoreham Rd.	Shoreham, Sussex BN45NE, E	-
Kits	Dick Edmonds Model Supplies	Unit 20 Vernon Bldg, Westbo	High Wycombe, HP112PI Engl	-
Kits	Dodgson Designs	21230 Dawson Road	Bothell, WA 98021	-
Kits	Elliott J.W. Boulouse	P.O. Box 430 Main St.	Morgantown, PA 19543	215-286-5129
Kits	Fox Models	115 N. Thornwood	Bavenport, IA 52822	-
Kits	Interwood Company	P.O. Box 681	Port Townstead, WA 98368	-
Kits	Larry Jolly Design	5501 W. Cobo	Santa Ana, CA 92703	714-826-6861
Kits	Lindsay Micro Products	160-A N. Fairview Ave., Sui	Goleta, CA 93117	805-683-2042
Kits	Metcalf Models	15 Brownlow Ave.	Southampton SO2 7BT, Engla	-
Kits	Off The Ground Models, Inc.	606C W. Anthony Dr.	Urbana, IL 61801	(217) 367-70
Kits	Performance Designs	2105 SE 85th. Ave.	Portland, Oregon 97216	-
Kits	Pierce Aero	9626 Jellico Ave.	Northridge, CA 91325	-
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Kits	Soaron Sailplanes	27 Brook Street	Wolston, England	-
Kits	Southern Sailplanes	31 Queens Parade, Burwood,	3125 Melbourne, Australia	USA 619-292-
Kits	West Mendip Sailplanes	16 Byron Rd.	Locking Weston-Sur Mare, A	-
Kits, FG Fuse, Foam Wings	Jerry Slates - Viking Models	2026 Spring Lake Dr.	Martinez, CA 94553	415-689-0766
Kits, References	J. Lee Smith	15 Ravenhill Road	Winnipeg, Manatoba, Canada	204-663-3387
Kits, References	Scott's Models	24755 Acropolis	Mission Viejo, CA 92675	714-581-6664
Kits, Soaring Supplies	Cliff Charlesworth	41 Spring Rd.	Frome, Summerset, BA112JW,	-
Kits, Soaring Supplies	Davey Systems	One Wood Lane	Malvern, Pa 19464	215-644-0692
Kits, Soaring Supplies	Milo Model Products	P.O. Box 236 Dept R	Nestor, CA 92053	-
Kits, Soaring Supplies	Progressive Models	20740 Warfield	Gaithersburg, MD 20879	-
Kits, Soaring Supplies	Sailplanes of the World	1501 Coffee	Nodesto, CA 95355	209-577-0506
References	Alex Strojnik	2337 E. Manhattan Ave.	Tempe, AZ 85282	-
References	American Aviation History Soc.	2333 Otis	Santa Ana, CA 92704	-
References	Andrew Coates Flying Books	Ziff-Davis Publ., ISBN 0-9	-	-
References	Herk Stokley	1504 N. Horseshoe Circle	Virginia Beach, VA 23451	-
References	Kookaburra Technical Pubns. Pt	P.O. Box 3175, Dandenong	Victoria 3175, Aust.	-

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4	5 May 87	2	Penton, D.N.	Aerodynamics, Stability
4	5 May 87	3	Fraser, David	Aerodynamics, Stability
4	10 Oct 87	5	Oldenburg, Ed	Airfoil, Aerodynamics
4	12 Dec 87	11	Abell, Bruce	Airfoil, Aerodynamics
4	4 Apr 87	11	Selig, Michael	Airfoil, Construction
4	2 Feb 87	10	Edmonds, R.J. (Dick)	Airfoils, Aerodynamics

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4	3	Mar 87	17	Gray, Jim	Book Review, Soale, Reference	4	1	Jan 87	0	Kincaid, Leon	HLG, Design
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**7TH ANNUAL  
ROSE BOWL  
SOARING FESTIVAL**

**DATE:** APRIL 30TH & MAY 1, 1988  
**PLACE:** PASADENA ROSE BOWL SECO & ROSEMONT AVE.  
**CONTEST DIRECTOR:** GARY ROBERTS  
**TIME:** SATURDAY 7:00 AM CHECK IN (MUST SHOW AMA CARD)  
 8:00 AM PILOTS MEETING  
 8:30 AM FIRST LAUNCH  
 SUNDAY 8:00 AM PILOTS MEETING  
 8:30 AM FIRST LAUNCH  
**TASKS:** SATURDAY 4 ROUNDS TO MAKE 20 MINUTES  
 NO FLIGHT OVER 8 MINUTES  
 SUNDAY ROUND 5 - 4 MINUTE PRESSION  
 ROUND 6 - 6 MINUTE PRESSION  
**LANDINGS:** POSSIBLE 100 POINTS  
LANDINGS WILL BE EXPLAINED AT THE PILOTS MEETING  
**CLASS / AWARDS** OPEN -- 15 AWARDS 2 METER -- 5 AWARDS  
 TEAM AWARD -- TOP FOUR FLYERS IN OPEN CLASS  
 WITHIN WINNING CLUB  
**RAFFLE:** TICKETS WILL BE SOLD AT THE EVENT  
 RAFFLE FOLLOWING THE CONTEST... THIS WILL BE A FUN CONTEST  
**ENTRY FEES:** EARLY REGISTRATION \$17.50 OPEN CLASS  
 \$10.00 FOR SECOND ENTRY  
 IN ADDITIONAL CLASS  
 ENTRIES LIMITED TO 150..... RESPOND BY APRIL 20TH 1988  
 FIELD REGISTRATION IF FREQUENCIES ALLOW \$22.00  
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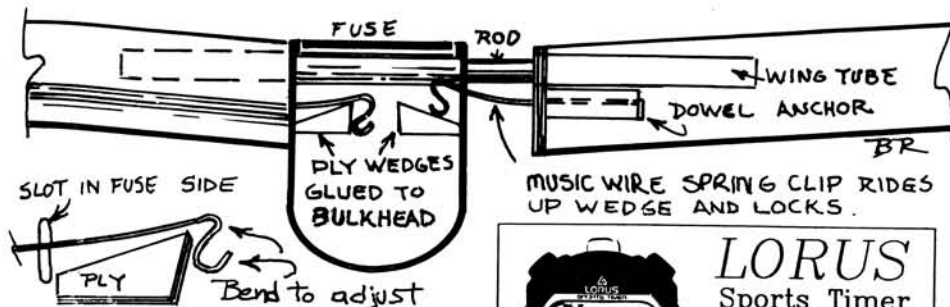
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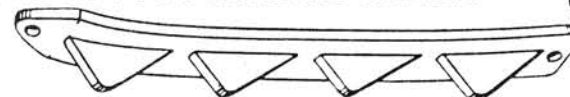
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