

THE VINTAGE SAILPLANE ASSOCIATION

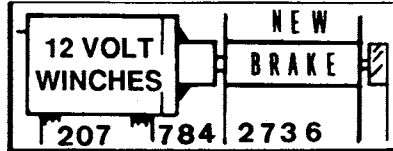
VSA is a very dedicated group of soaring enthusiasts who are keeping our gliding history and heritage alive by building, restoring and flying military and civilian gliders from the past, some more than fifty years old. Several vintage glider meets are held each year. Members include modellers, pilot veterans, aviation historians and other aviation enthusiasts from all continents of the world. VSA publishes the quarterly magazine BUNGEE CORD. Sample issue \$ 1.-. Membership \$ 10.- per year.

For more information write:

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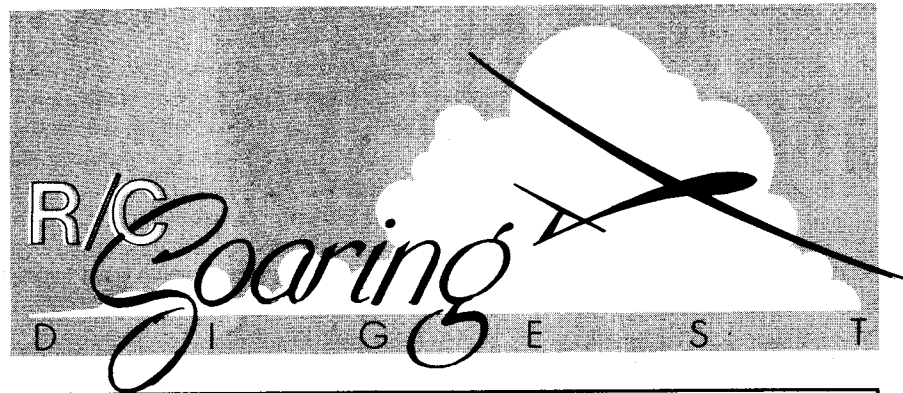
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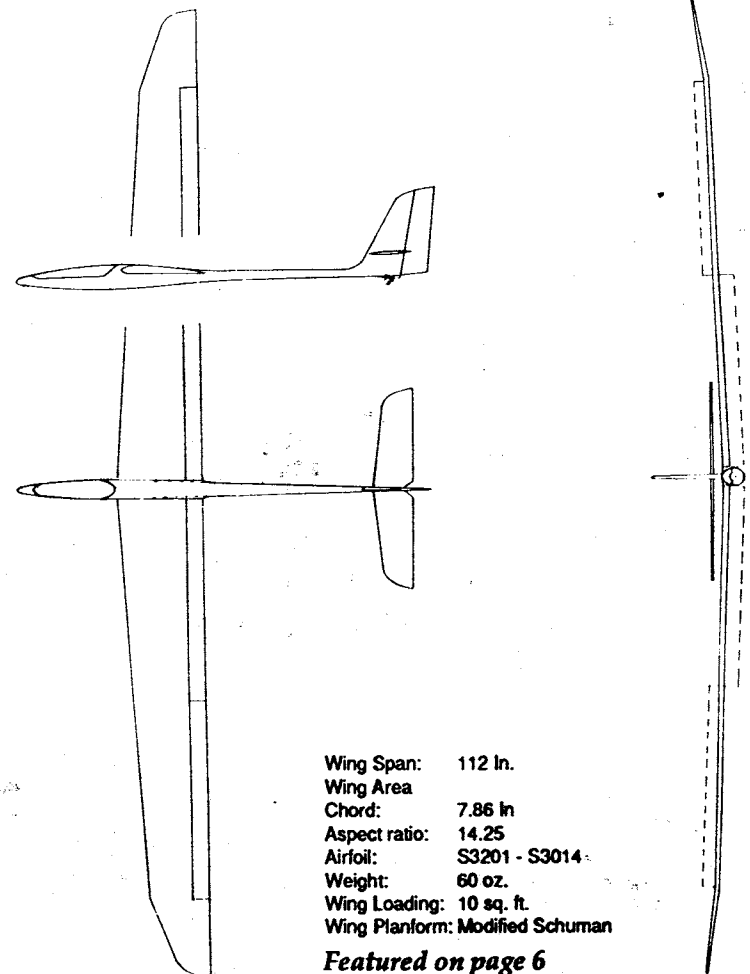


Vol 6.

No. 5

May 1989

MarkAllen's **FALCON 880** - Contender in the RCSD challenge



Wing Span: 112 in.
Wing Area
Chord: 7.86 in
Aspect ratio: 14.25
Airfoil: S3201 - S3014
Weight: 60 oz.
Wing Loading: 10 sq. ft.
Wing Planform: Modified Schuman

Featured on page 6

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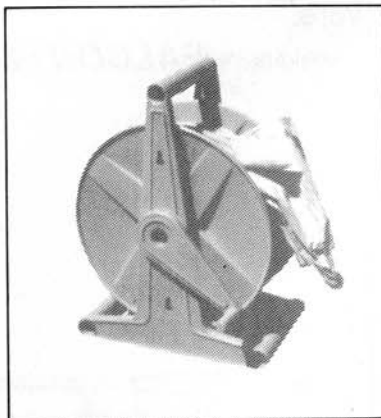
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High Start

My thoughts this month are about evenly divided between "retirement" and what I can do in the future to make RCSD even better. Perhaps you've noted lately that we've grown a bit in size and have certainly improved the appearance and readability. These matters were discussed in a previous editorial and won't be elaborated here.

The point is that RCSD is growing in many directions. Circulation is now about 1100 in 16 countries, and we receive comments, renewals, and new subscribers at the rate of several per day. Your magazine has received so many plaudits and kudos from readers that I am embarrassed to publish them for fear that I'd be accused of "blowing my horn" but the truth is that RCSD is now considered to be the premier R/C soaring publication on the market; not by some hypothetical agency calculation, but by YOU, our readers.

One of the most popular sections continues to be our reader letters, published under the GRAY AREA. You have really "made" the reader interest by telling us what you are doing, when, with what, and how. I guess maybe that's why I generally read the "Letters to the Editor" column first in the magazines I read. We're all human, and we like to know about each other...so this month, we have even more good input and feedback from your peers.

Still more entries are being received in the RCSD Challenge, and most of them represent the current thinking about what constitutes a "Sportsman F3B" event. Lately, the trend seems to be to call this "multi-task soaring and multi-task sailplane" - a term which I must credit originally to my friend Ed Slobod. Ed coined the phrase "multi-task" way back in the early-to-mid 1970's, if not earlier. When he and I used to correspond, long before his removal (as the English say) to California, he was busily proposing and designing a true multi-task sailplane called the GEMINI MTS. True, it didn't appear for many years, but the germ of the idea was there...and Ed used to lament the "sameness and boredom" of contests at that time. His impression was then, and presumably is now, that the only route to the development of RC soaring is via a wide variety of tasks that challenge a designer to produce a sailplane that can perform well in each of them. The "onward and upward" progress of all RC soaring is largely based on multi-task events these days, and it is for this reason that RCSD has challenged our readers to aid and abet this progress by making entry into multi-task soaring both fun and rewarding to ALL participants. From what we see so far, it's the right place and the right time for a "quantum" jump, and I—for one—am eagerly awaiting that event.

*** Pilot Error ***

Happy Soaring,
Jim Gray

In our March issue article "Video from Julian" the phone number and the Zip Code were in error. The RIGHT Zip Code for Channel One Productions is: 77338, and the RIGHT phone numbers are: (213) 540-3944 (eve.) and (713) 443-1253 (day). RCSD regrets the error and wishes Channel One Productions and Julian Tamez every success with his products.

The VINTAGE SAILPLANE ASSOCIATION, announces its **Second Annual Western Vintage Sailplane Regatta** on May 27th & 28th at the Hemet-Ryan airport in Hemet, CA. This is a vintage FULL-SIZE sailplane meet, and a MUST for lovers of scale and vintage sailplanes. Bring your cameras. Events include spot landings, static displays, R/C model sailplanes, a Sunday-night cookout and guest speaker. Registration is FREE and the V.S.A. will supply Saturday-night barbecue equipment. Bring your own food. Camping is available on the field. For pre-registration and more info., contact Harry Irvine, 6028 Freckles Road, Lakewood, CA 90713, or Doug Fronius, 1121 Nidrah St., El Cajon, CA 92020.

Electric Currents

...by Felix Vivas

I'm sure a lot of you reading this new electric column have noticed lately a great surge in interest and growth in electric powered model aircraft, especially at the IMS Show held in January in Pasadena, California, and the "jump" in advertise-

ments for electric aircraft, motors, props and speed controllers in model publications.

Hopefully, I will be helpful in encouraging you to try the various facets of using electric power in your model flying.

I think the simplest way to start is to use a two meter size kit aircraft that is already known as a good flyer and has room to install seven batteries and a motor. The ideal battery is the Sanyo 900 ma SCR. The weight and size ratio to output of power is the best and it has the least resistance. For you slope flyers with smaller fuselages, use the 800 ma batteries.

For motors 05 size are ideal. Astro or Leisure electric motors are fine. Astro has cobalt 05's and FAI six wind competition motors if you've got the "bucks". Leisure has some fine gear drives to go with their new 05 motors. Both companies have been in business for a long time and are reliable.

Should I use direct drive or geared motor? The direct drive for smaller aircraft and geared for fuselages that can take the gear box at around the two meter size wing span.

For speed controllers you can use a small servo along with a small "push on" electric switch from a local electrical store. Or a small speed controller, with brake, in the 30 amp range. If you go the servo with push on switch, it must be wired to create a brake for the prop. We don't want a windmilling propeller during flight or on landing.

There's a lot of speed controllers on the market lately, so take into account a reliable manufacturer. Low current draw will take a high current surge and has a brake to stop the propeller.

As for your folding propeller, use Hi-Performance props from K & W Enterprises, Inc., 7824 Lexington Avenue, Philadelphia, PA 19152. Send SASE for their catalog. It will recommend propeller size and pitch for your motor aircraft operation. They're about the best available and fairly priced.

That's it 'til next issue.

Questions? Call or Write:

Felix Vivas
1800 16th Street H-310
Newport Beach, CA 92663
(714) 645-3263

Coming Events

International F3H Sailplane Cross-Country Contest: July 7th through 9th, Taft, California (about 3 hours north of Los Angeles). AMA, FAI, F3H Rules apply. Hosted by Thousand Oaks Soaring Society. Contact Art McNamee, 14950 Youngdale Place, San Fernando, CA 91342.

National Soaring Skills Symposium: May 27 & 28, 1989 at National Antique Airfield, Blakesburg, Iowa, three miles north on county road H41 and 8 miles southwest of Ottumwa on same road. Camping and restroom facilities available for participants. Fun, flying, instruction, displays, cross-country, F3B and much more. Contact Rusty Shaw, Box 225, RR2, Ottumwa, IA 52501, or Bob Ferguson, 1105 North Court St., Ottumwa, IA 52501; Telephone: (515) 682-4326.

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* * *

Incidentally, Ben is trying to locate the following kits: Soarcraft CENTURION II, and Soarcraft DIAMANT. If any reader has, or knows where to obtain, these kits, please call or write Ben at the listed address. JHG

Ben DeMeter
7920 Candleflower Circle
Colorado Springs, CO 80920
Tel.: (719) 531-0350 (days)
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On The Wing ...by B²

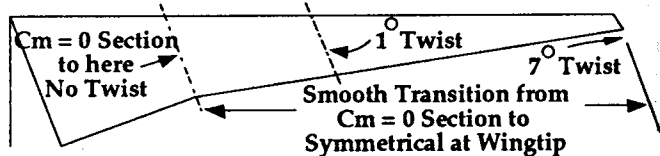
Swept wings can make use of a variety of airfoils, so long as the download at the wingtips counteracts the pitching moment of the lifting surface and provides stability. The wing, therefore, usually incorporates aerodynamic and/or geometric twist, and this month we'll talk about three twist techniques.

To look at the Horten IV or Horten VI is to gaze upon pure beauty. How were the Hortens able to achieve the stability required for flight, much less maneuverability in thermals? Dr. Reimar Horten explains that it is a matter of using a root section with no pitching moment, a symmetrical tip section, and the proper amount of twist.

The wing twist method used by the Hortens allows the wing to stall at one third half span, at the location of both center of pressure and center of gravity. This has several beneficial effects: (1) the wing can be trimmed easily with small amounts of elevator movement, (2) ailerons remain effective past stalling, and (3) adverse yaw is minimized. With regard to this last point: be aware that the Hortens used two sets of ailerons and the aileron differential was two way — in a left turn the outboard left aileron went up 20°, the inboard 2° up, the inboard right went down 20°, the outboard 2° down. The ailerons also moved differentially during elevator deflections. Stability and lift distribution were thus maintained during a variety of flight regimes.

The Horten lift distribution can be fairly well duplicated in a model by using the airfoils described above and a total twist of 7°. Build the wing so that the first 25% of the half span uses the zero moment section. The remainder of the wing transitions from the root section to a thinner symmetrical section at the wing tip. No twist is used for the first 25% of the half span, one degree is used at the 50% point, and seven degrees are built in at the tip.

If you're constructing with foam, the outer 75% of the half span can be cut in one piece, achieving proper twist and transition of the wing sections



at the same time. Using a sufficient number of shims, simply twist the sheet of foam the correct amount in the opposite direction to that needed for the finished wing. Weigh it down for cutting. Place the root and tip templates on the ends with no twist relative to the work surface. Once the core is cut the shims are removed and the wing is constructed on the foam beds, as usual. With the beds lying on the flat surface the proper twist is built in!

Model sailplanes using the Horten twist method and keeping the same aspect ratios and taper as the originals will probably suffer from the very low Reynolds Number at the wing tips, even in quarter scale. Be aware and beware!

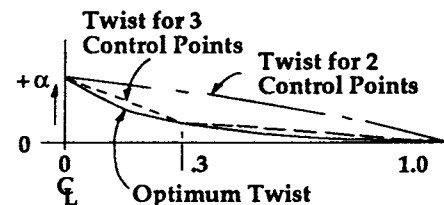
One final thing about the Horten wings, you'll notice that some of the Horten designs have "bat-tails". If you plot out the quarter chord line for these designs you'll see that it bends and meets the aircraft center line at 90° on the Horten IV, and sweeps forward at the center on the VI. Because of the angle at which the leading edges meet there is a loss of lift in the center section, the bat-tail is a means of reducing this effect. The lift gradient of the Horten VI compared favorably with that of a conventional sailplane.

Irv Culver, retired from the Lockheed "Skunk Works", has presented a lift distribution and wing twist method different from that of the Hortens. While the Hortens place the twist toward the wing tips, Culver puts the twist toward the root. The goal here is to reduce induced drag and achieve optimum span loading.

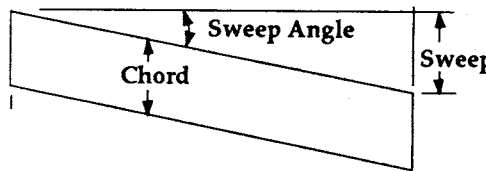
Culver's method is not so simple (!) as that of the Hortens, as it involves a formula which

requires that overall design lift coefficient, aspect ratio, sweep angle of half chord line, and zero lift angles of the sections used to be known and specified. (It is too involved for presentation here, but we'll share it, and the QBE formula, with anyone sending a SASE.) Typically, Culver's method relies on three control points — root, 30% half span, and tip.

The twist configuration advocated by Culver is easily accomplished with foam core construction, a definite advantage. Also, if a section with high coefficient of lift is chosen, trimming for high speed can still be accomplished with deflection of tapered elevons. The disadvantage is adverse roll-yaw coupling — there is excessive roll when the aircraft is yawed. The solution is to bend the wing tips down, as seen on some of the Northrop wings.



QBE is the third method of achieving correct wing twist. QBE stands for Quick But Effective. Cutting the foam core wings couldn't be easier: align wing root template at 0°, set up the wing tip template at the predetermined angle, and cut the foam. A wing half can be cut in one piece with straight taper and straight twist built in. The real secret is in determining what angle to use when aligning the wing tip template on the foam. There is a formula (see our offer, above), based on zero lift angles, moment coefficients, sweep ratio, and a stability factor, but there are a few suggestions from designs that fly well: (1) Eppler 174 root, Eppler 182 tip, constant chord, wing swept 1.5 chord lengths measured at the tip, 4° twist; (2) Eppler 180 root, Eppler 184 tip, aspect ratio of 9.1, 20° leading edge sweep, 1° twist; (3) Eppler 222 root, Eppler 230 tip, constant chord, wing swept 1.5 chord lengths measured at the tip, 0°; and (4) Eppler 224 root, Eppler 230 tip, constant chord, wing swept 1.1 chord lengths measured at the tips, 0° twist.



All through the above discussion we've talked about foam core construction — that's because it's both accurate and fast. Foam core construction promotes rapid design evolution. Experiment and share your findings with others!

1. The bulk of this information came from an article by Jan Scott of the Vintage Sailplane Association, originally published in The Bungee Cord (Vintage Sailplane Association, Route 1, Box 239, Lovettsville VA 22080), and from Dr. Martin Lichte's book "Nurflugelmodelle". Additional information can be found in TWITT Newsletter #10. TWITT's Newsletter, edited by Marc de Piolenc, is a must for anyone interested in flying wings. TWITT, P.O. Box 20430, El Cajon, CA 92021.

2. TWITT Newsletter #4.

3. For further information, see MTB (Modell-Technik-Berater) 1/2; these were originally published separately, but are now under one cover. (Were available from Wilshire Model Center, 2836 Santa Monica Blvd., Santa Monica, CA 90404.)

BY
Bill & Bunny
Kuhlman
P.O. Box 975
Olalla, WA 98359-0975

EXCALIBUR!

What RCSD Readers Are Building & Flying

Dear Jim,

Here are the photos of my EXCALIBUR that I promised to send. Sorry about the quality, but they should be good enough to give you some idea of the plane's lines.

The one photo shows the plane with the wings pivoted for a left turn (the lack of differential is for photo purposes only; in reality, there is about a 2:1 differential used when flying). A second photo shows the plane in landing configuration with both tips pivoting up (t.e. up). This method of slowing the plane does work, but more throw is needed to really slow the plane down (unable to achieve with the particular control setup I am using). The other two photos just show assorted views.

The control response that can be had with the pivoting wings is great and I would love to be able to use this kind of control system on an F3B ship, but the loads imposed on the servos at the high wing loading, total weight, and speed in F3B competition are just too great.

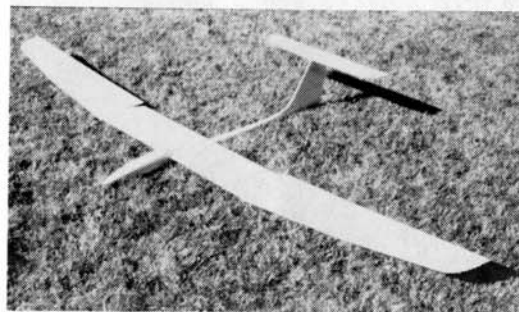
The changes I am planning to bring the ship up to F3B standards include a change to a better all-around airfoil (more speed!), reduced stab size, conversion to ailerons and flaps on the wing, addition of rudder, and an overall "beefier" construction.

The other photo I enclosed is of my hand launch ship, the MONTERO. Just as with my SCIMITAR, all control is obtained by pivoting the wings (roll and pitch). The ship spans 1.5 meters and weighs in at just under 12 ounces. Construction is mainly balsa with carbon fiber reinforced spars and carbon fiber wing rod (allows for zoom launches off of most standard winches). Airfoil is an Eppler 387. Hand launches with this ship are as high as you will see with any plane and its turning ability is unmatched by anything I have ever flown.

Will keep you up to date on the progress of EXCALIBUR #2.

(signed) Mark Triebes, 20794 Kreisler Ct., Saratoga, CA 95070

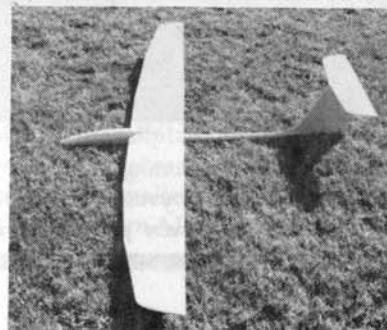
Response: Thanks, Mark for the photos and letter. I understand that EXCALIBUR II will be your formal entry into the RCSD Challenge, and I'm looking forward to hearing more about it and seeing the pix. The MONTERO is a neat looking ship, too, and I wish you luck with both designs. Readers to note that Mark is the Slope Soaring columnist for Model Aviation magazine. JHG



(Left) Mark Triebes' EXCALIBUR I is intended for T-D soaring and features pivoting outboard wing sections for roll control. Pitch and yaw are through elevator and rudder in the normal manner.

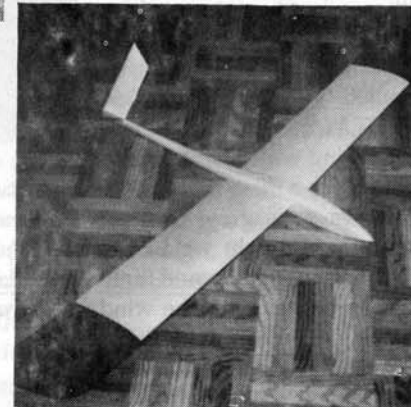
EXCALIBUR II will be built for F3B "Sportsman" events, i.e., multi-task soaring.

Note right T.E. pivoted up.



(Above) This view of Mark's EXCALIBUR I shows the "Discus" leading edge shape - a currently popular 'fad' that is said to provide better lift distribution and thermalling capabilities with less drag than conventional shapes.

The question remains as to whether it is as effective on models as it is on full-size sailplanes. Some builders report tip-stalling problems, while others seem to note the expected improvements.



(Above) The MONTERO is Mark Triebes' newest hand-launch design. Pitch and roll control are achieved by wing pivoting.

Span is 1.5 meters and weight is a mere 12 oz. ready to fly! See Mark's letter for more info.

New Kit On The Block

...by Jim Gray

Mark Allen, designer of the EAGLE has come out with a new sailplane intended for multi-task and thermal duration soaring. Mark's company is called Flight Lite (or is it Flite Light?) Composites. The address is P.O. Box 1493, Windsor, CA 95492, and the telephone is: (707) 838-3390.

* * *

The wings are foam core with a spar extending out 25" from each root, plus a carbon-fiber reinforcement extending 30" from each root. The wing has a straight trailing edge with a 10" root, a 7" - 4" tapering tip. The semi-kit is priced at \$105; a complete kit at \$175; and a partly-finished kit at \$275. Shipping is extra. The tail is a standard type and the 'foils are symmetrical NACA 0009's. Flaps, ailerons, rudder and elevator are provided, and the wing has a generous dihedral for increased stability.

RCSD hopes to have a review of the kit soon.

As a matter of fact, Mark intends to enter the FALCON 880 in the RCSD Challenge.

The new sailplane spec's are pretty interesting, and should result in a competitive machine:

Wingspan: 112"

Wing Area: 880 Sq. In.

Aspect Ratio: 14.2

Airfoil: Selig 3021 inboard and Selig 3014 at the tip

Weight: 60 Oz. (no ballast) for an empty weight (with radio) of 10 Oz./Sq.Ft.

Fuselage: One-piece fiberglass with Kevlar-reinforced tail boom. Comes ready-molded with wing fillets molded in.

We Have Liftoff!

Jim Cox writes:

Really enjoyed talking to you, and sure thank you for the information. I have four projects going right now, plus repairs to the KADET and PUSSYCAT. I broke both in a gusty wind of 25 mph that I shouldn't have been playing in!

Earlier in the morning (the wind) had been 10-15 mph, so hauled (a) friend's Multiplex FIESTA for its first flights. Boy, that thing really flew off the bench for a first flight of 16 minutes on a grey, overcast morning; thought we'd have to shoot it down! Second flight of 12 minutes with the wind picking up. He (the FIESTA pilot) quit because of the wind, but I decided to play a bit longer...so I got caught too slow on landing. Hurt not bad, but I need to rebuild a new (fuselage) section behind the wing.

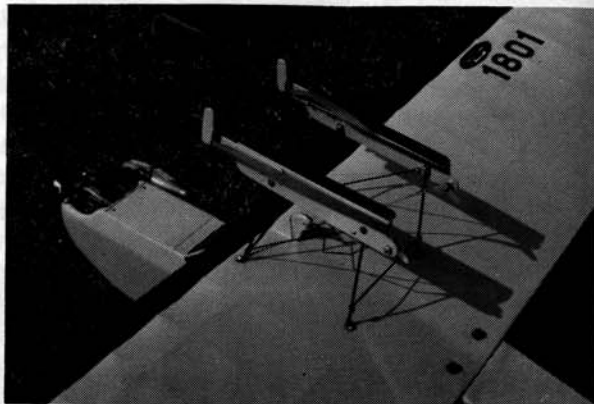
The photos show my Sig KADET with a Fox Eagle III using a 14x6 'Master' prop. It did very well with this combo, so I decided to break in a new COMO 90 for Sportster. Since it fit the mount on the KADET, I switched. It gets out of the grass better and climbs a little faster with the same 14 x 6 'Master' prop.

After rebuild, I'll put the Fox back in since it was a good combo.

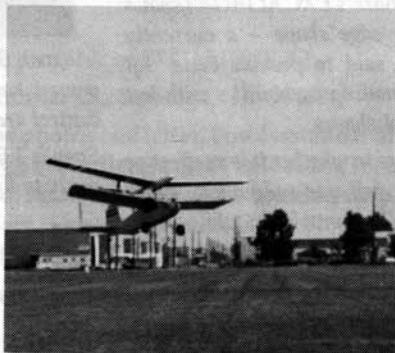
Now, I'm building a Robinhood 99 with a G-38 (motor) for 3-to 4-meter (sailplanes), but will use the KADET for 120"-span and lower sailplanes. Without ailerons, the KADET is a bit hard to handle in the wind with wings over 120" on the ships I lift.

I estimate I've made over 800 'hauls', and quit counting at 500. I want to try an Eppler 214 on a 120" wing, and the rest will be like the SCOOTER or SAILFISH...but using a foam wing.

Thanks again! (signed) Jim Cox, 2113 Bingle Road, Houston, TX 77055; Telephone: (713) 465-1792.



SIG 'KADET' with above-wing mounting system to hold sailplane for quick and easy 'lifts'. Heavy rubber bands go over the sailplane's wing; fuselage fits between 'plyons' on cradle. Tow pilot operates release servo upon command, and sailplane is up and away.



...And away we go! Quick takeoff and easy climb-out characterize the pick-a-back launch. A few minutes to 1000 feet, and the KADET is back at the flight line, ready for another lift. Try it -- it is fun!

What RCSD Readers Are Building & Flying



"Ready for takeoff." Beautiful scale sailplane waits for 'lift'. SIG KADET patiently waits for its pilot to start engine and go. Jim Cox says over 800 'lifts' have been made with no problems for either sailplane or tow pilot.

Response: Jim, your efforts are well rewarded, because you have given encouragement to those of us who are looking for a new (and better?) launching system. I have seen a ship similar to the Senior Telemaster or the Big Lift haul sailplanes all day long to altitudes as high as the pilots liked. NO problems at all, and the tows were superb — as well as just as fast, if not faster than the winch, figuring in the time to haul in winch lines, etc. The "tug" lands right back at the flight line after a tow, and is ready to go for another. Hookup of the sailplane on top of the tow plane is quick and easy. I watched an ALPINA lifted to 1,000 feet or more in just a couple of minutes. Here's another good way to save space and use smaller fields for launching. I estimate the take-off run was less than 75 feet, even with an ALPINA on board. Thanks for the show and tell, Jim. JHG

News Flash!!!

Low Reynolds Number Airfoil Video Available

The testing is finally finished! Following 2 years of setup, more than 1200 hours of tunnel time were used to test 60 airfoil sections, yielding 130 polars. Your support for this program is greatly appreciated, not only by Michael, Dave and I, but also all of the modelers who use the data.

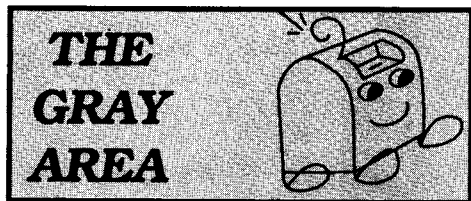
We apologize for the delay in getting this video to you. Like everything else, experimental work takes longer than expected, in this case by at least a factor of two! None the less, the testing was completed in January at which time the video was made. In mid-January Michael left for Penn State and I moved to St. Louis where I am working at the McDonnell-Douglas Research Labs. All of us are currently working on the writing of SOARTECH and hope to finish by June. We feel confident that it will be worth the wait.

Approx. 20 copies of the video were made at Princeton. The quality of these reproductions is reasonable, but not as good as can be made professionally. But since we knew you would be getting anxious, we wanted to get your copy to you as soon as possible.

To offset some of the debt incurred by Michael and me during the latter part of the project, we intend to have more copies of the video made - this time professionally - for sale at \$20 each. These copies will be done by a production house so the quality will be better. This type of firm works on a volume basis. Thus we will accumulate orders for the video until September. Assuming we have at least 30 orders, they will then be filled through the production house; otherwise, we will refund your money.

If you know of anyone else who might be interested in obtaining a copy, please have them contact me: John Donovan, 754 Stone Canyon Drive, Manchester, MO 63021.

Again, we want to thank you for your support, (signed) John Donovan



Soaring - better by a dam site?

Dear Jim:

...Lastly, we have been doing some sloping recently off a dam near our town (using two-meter thermal ships). Unfortunately, we were run off for trespassing...but, the land below the dam is open to the public and is mowed by dam maintenance. We now use a hi start and glide over to the 'ridge' lift. We have also discovered a thermal area about 200 yards in front of the dam, and I would like to see a diagram of air currents explaining this effect. These conditions provide consistent one-hour flights, and we spend a lot of time worrying about our batteries running down in the air. The enclosed drawing is my best effort.

♣ (second letter about a week later) ♣

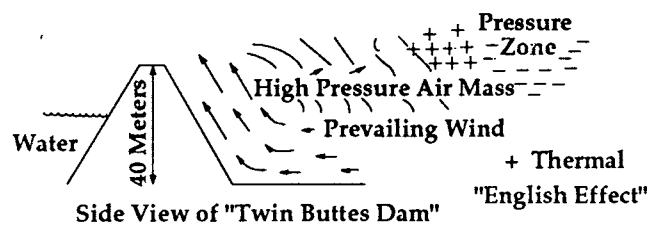
Dear Jim:

I have been thinking about the thermal effect I mentioned in my last letter and I think I might have an explanation. I now believe it is due to the steep angle of the dam face, and can probably prove my theory by testing it on cliffs and or other steeply inclined slopes.

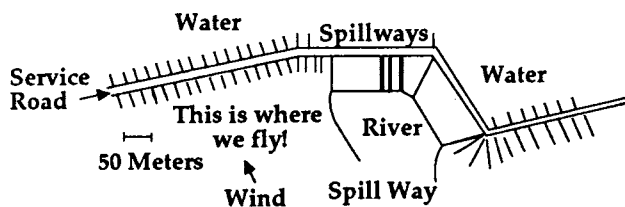
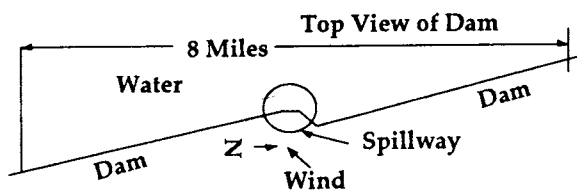
I think that the air that is moving along the field in front of the dam produces a high-pressure wave once it hits the dam face. The mass of air associated with normal ridge lift produces a bubble which moves into the bubble relatively low pressure area above the field in front of the dam. I am not a meteorologist but the diagram I have enclosed should give you some idea of what I think.

Still enjoying RCSD,

(signed) Christopher D. English, 834 McDevitt Street, San Angelo, TX 76905



Side View of "Twin Buttes Dam"



Response: Thanks for the letter and drawing. I was about to suggest that there may be a 'wave' effect produced by the wind and located downstream of the 'ridge', but after looking over your sketch, I am sure that I was wrong. This is an interesting "micrometeorology" condition, and needs some serious thought. I wonder what some of our readers think? Maybe they'll let us know! What about it, readers? JHG

'Alternative Launch Means'

Dear Jim:

I was looking through my cherished collection of RCSD issues, and one article caught my eye. In the February '87 issue, page 18, you discussed 'Alternative Towing Techniques'. You mentioned auto towing and winch towing, and invited your readers to share their experiences in the modelling world. I pulled from my memory banks the following experience...

Approximately 1973 I was still flying 'free-flight' gliders, and happened to have a Jetco THERMIC 50X on hand. My buddy down the street received a new Cox race car for Christmas, and was showing off by buzzing up and down our street. The car was powered by a Cox .049 with pull starter, and equipped with a centrifugal clutch.

To make a long story short, we attached a 60-foot length of Dacron line to the car and used a standard release on the glider. We had to run with the glider until the car really started to pull. This setup worked fine until the glider landed on a major road and was crushed. Towing tension was automatically regulated by the glider as it pulled up the back of the car, removing the drive wheels from contact with the ground! Not bad for a couple of 15-year-olds, huh?

Incidentally, I also experienced a few tow launches by winch at Torrey Pines in a Schweizer 1-26. What a ride!

Soon, I'll send you some info. on our 60-inch span club slope soarer called LS-1 (La Sierra 1).

Here's 'wind in the face', (signed) Mike Reed, 1775 Dumitru Way, #B, Corona, CA 91720

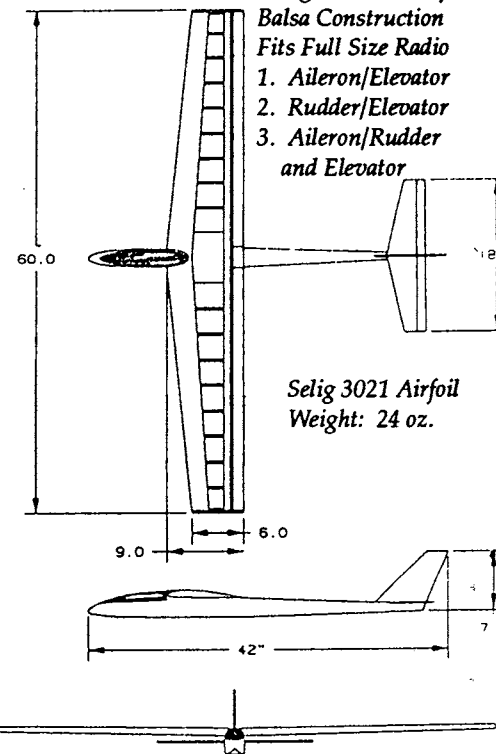
Response: Leave it to the Californians to be there first! Mike, what a neat idea! Now, with radio-controlled cars on frequencies that won't (are not supposed to) interfere with glider frequencies, R/C car tows of

Features

Wing Area: 447 sq. in.

Balsa Construction
Fits Full Size Radio

1. Aileron/Elevator
2. Rudder/Elevator
3. Aileron/Rudder and Elevator



L.S.S.S. CLUB SLOPE GLIDER

R/C gliders ought to be a 'natural'. Who will be first to explore the idea and report results to RCSD? By the way, I have experienced many auto and auto-pulley tows, as well as winch tows, in full-sized sailplanes when I was soaring back in Elmira at Harris Hill in the 50's and 60's. Many times I launched 'feet first' or so it seemed, and remember the 'bucking' when the sailplane 'peaked out' on tow. We never pulled the wheels of the tow car off the ground, but I can well imagine the driver's sensation had that ever happened. By the way, I believe it did when auto-towing from a frozen lake. Your new LS1 looks really neat, and we all look forward to seeing the spec's. JHG

More pix from "Downunda"

G'Day, Jim:

Sorry to be so late in writing, but things have been a bit hectic these last couple of months! The Ausyralian Nat's, then the Sailplane Expo and a trip to Queensland to take care of some family matters. As they say, 'there's no rest for the wicked.'

My 'AIRBORNE '88' a.k.a. SCIMITAR did me proud at the Expo in Armidale last month. I came 2nd out of 30-odd entries, behind Martin Vels (STEPP3) and ahead of Phil Grandon (APOLLO) in 3rd place. I might have won if I hadn't 'blown' a couple of landings. I'm now contemplating building a new set of straight wings with 5-degree dihedral and fitted with ailerons and flaps. The slight dihedral will give my bird a slight positive lateral stability so that it can be flown 'hands off' and the ailerons will give quicker and better roll control response on the landing approach in windy conditions. With a rudder/elevator model you have a bit of a problem lining up again if a gust of wind gets under a wingtip during landing, but an aileron bird is far more responsive under these conditions.

The conditions at EXPO were moderately strong winds with weak patches of lift on Saturday and slightly better lift on Sunday, so it was a very good test of a model's ability to thermal well in weak lift, yet still penetrate into the wind to find the lift.

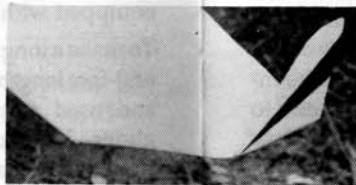
One of the interesting things that Expo showed up (to me, at least) was the advantage of a reasonably large span (around 120") coupled with a fairly high aspect ratio (around 15:1). The top three models all fitted this spec! Food for thought, eh?

By the way, have you seen the new Pommy (Limey, to you) 'Litespan' covering? It's about the same weight as light-weight tissue, but 4 times stronger, and heat shrinks, too! You put it on with 'Balsarite' or PVA, then ironed, and finally heat shrunk like 'Micafilm.' The silver is -- beautiful! Great



(On the left) Looka them wings! Don Woodland (West Australia - Jr.) with his Second-Place stretched ALPHA H, flown into second place in Thermal Glider only 34 points behind winner Steve Wiesner at the Australian '89 Nat's. Model originally built in 1978 and since modified by stretching the wing from 2.8 meters to 3.1 meters. New aspect ratio is 16:1.

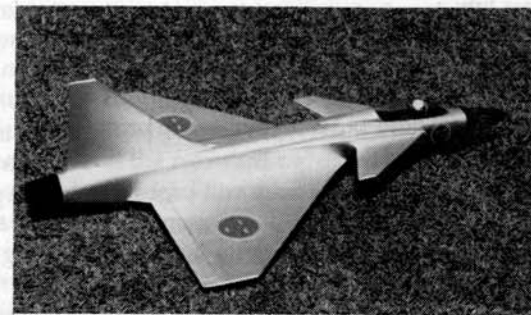
(Below) Tip shapes do count...Wing tip on Don's modified ALPHA H. Note the use of 'winglets' as well as short tip chord and the swept-back tip now in vogue among those who seek to reduce tip vortices and thereby reduce induced drag. A double effect appears to be what Don was seeking here, and it looks like he did some good with the mod's.



(Below) A pair of original designs by Ron Cooper. "ITSA 2M" fairly obvious, but "SITA" means "Square Is The Answer". Models perform very well. Transparent dark blue with transparent yellow wing and tail stripes, edged in white. Name in white, too. "Plank" planform and unswept tips remind us of any number of U.S. designs. Good formula for T-D contests.



Elevons, only. Here is a slope scale jet model of Sweden's S.A.A.B. "Gripen" (Gryphon in English). It was built from plans in the English magazine Radio Modeler for the powered version. Ship has silver-blue metallic color with the Swedish Air Force markings on wings and fuselage. Black nose & tail cones.



for those small rubber-powered scale jobs!

The Nat's in Queensland were very good, although I didn't compete as I wanted to see (and photograph) everything. I met up with blokes I hadn't seen for over 30 years! A real nostalgia trip for us 'old timers'!

Well the 88'er did me proud again! Unfortunately, the pilot flew like a hairy goat!! I came in 3rd out of 17 entries and should have won, only I completely 'blew' one flight, scoring only 600 points out of 1000, because I elected to re-launch instead of staying with my flight time of 4 minutes (which would have won)! Again, my landings left a lot to be desired...I sure need practice!!

Conditions were very testing and quite similar to the Sat. at Armidale: weak, scattered lift; cold 10-15 mph winds, and max flight times the exception rather than the rule. Conditions favored the consistent pilot instead of the lucky one.

(signed) Bruce Abell, 17 Ferguson Street, Cessnock 2325, NSW, Australia

Response: Thanks again, Bruce, for the fine letter and photos, and congratulations for the 2nd and 3rd places in two different contests! I know the "Airborne '88" is a good flier, and want to pass on the information that plans are available through the magazine. Perhaps anyone interested will write you for further details. JHG

The Buddy System

The A.R.B. COMPANY of Dunwoody, GA has announced a new "Buddy System" that they call "The First Affordable R/C Trainer System". Designed to be installed in Futaba and Airtronics radios, THE BUDDY SYSTEM is designed to be used with the same channel, and can be retro-fitted to other radios. Installation takes about 30 minutes by anyone who can solder two wires together. Easy-to-use, low cost, increased margin of safety during instruction, instantaneous switching between radios, and no handing the radio back and forth are just a few of the claimed features of this system. Cost is \$34.95 for the kit, plus \$3 S&H. For an additional \$15, A.R.B. will install THE BUDDY SYSTEM in your radio for you. Just send two radios with the same channel and a check for \$54.95 (which includes shipping and handling), and allow six weeks for processing.

RCSA has neither seen nor used this new system. However, if it works as advertised, it should provide a much-needed help for instructors. Call or write: A.R.B. Company, 8825 Roswell Road, Suite 613, Dunwoody, GA 30350; Ph...: (404)993-6983.

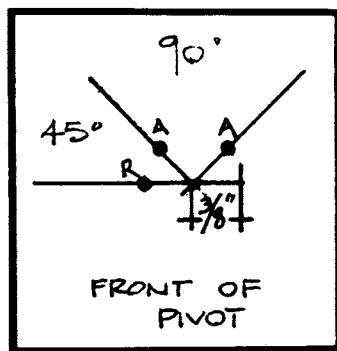
Dear Jim:
What have you done to me?! Do you realize that every Dodgson fan in the world now HATES me? True, I did say that my PIVOT wasn't very hot—but did you have to print it?

Anyway, what I have to say will probably help me save some face, as we seemingly transformed the PIVOT from a lawn dart into a true mini-WINDSONG!

It all started with CAMANO. After building and flying one, I have now become a DODGSON DISCIPLE. More on that later. BUT what of the PIVOT?

After much flying, observing, thinking and more flying, I came to the conclusion that the aileron (wingeron)/rudder coupling was incorrectly proportioned for my style of flying. No matter how I adjusted the amount of throw on rudder or wingeron, the result was either a slipping or a skidding turn; neither one being very conducive to smooth flying.

So, why does the CAMANO handle so well, and the PIVOT so jagged? The difference seemed to be in the wingeron/aileron throw. CAMANO uses a 2:1 differential, and PIVOT uses a 4:1...so a change seemed worth a try. Well, after several flights, I can say with absolute certainty and without a doubt, that the PIVOT handles like the CAMANO (wonderfully) with that one simple modification.



Here's how to transform the PIVOT into a seemingly more balanced sailplane:

Fabricate a servo wheel to these dimensions. This ar-

angement gives you a 2:1 wingeron throw and the same rudder throw as with the stock system. This seems to balance the rolling and turning performance of the PIVOT.

Now, back to CAMANO - Jim, I would like to enlist the aid of your readership (to help) with a problem. My CAMANO flies unbalanced at 10.3 oz./sq.ft. wing loading. When adding 4 oz. of lead at the prescribed location, bringing the ballasted wing loading to 1 oz./sq.ft., the sailplane DIVES off tow and doesn't seem to respond well to trim changes! The last time I flew with 4 oz. of ballast, the CAMANO started diving - and when I got it flying level again, it snapped over into a spin. Two hundred feet lower, I managed to pull out and land safely. I immediately suspected radio failure, and now have that being inspected by a technician.

I've also sought advice from several others, including Master Dodgson, himself. Many suggestions were made and need to be investigated. However, the constant seems to be ballast, and the addition of as little as 4 oz. has the described effect.

A Futaba repair technician in the area has suggested that the receiver (Attack 4-channel radio) cannot handle the proximity of the metal pushrods—but the problem only occurs when ballast is present. The sailplane flies wonderfully without ballast.

Another suggestion was that I simply stalled the wing when in a turn configuration, and naturally fell into a spin. This is logical: however, I've never seen a wing of high aspect ratio roll so violently, and this theory does not address the diving symptom.

I understand that it would take up much of your space to print such a selfish letter, but any assistance you (or your readers) could provide would be welcome.

At any rate, please DO print my PIVOT comments! Even Bob Dodgson was very interested in what I've done.

Sincerely, (signed) Don Wienecki, 161 Stewart Avenue, Buffalo, NY 14211

Response: Don, I won't try to be a know-it-all, but your problem sounds very much like a rearward c.g.; that is, a c.g. that is TOO FAR to the rear. Symptoms of this condition are exactly as you have described: diving (even tucking on rare occasions) and violent snap rolls at unexpected speeds...as for example in a high-speed stall. A snap roll is, in fact, a horizontal spin in the stalled condition! It would be my guess that when you add ballast, it aggravates a c.g. already trimmed to its rearward limit (yes, yes, I KNOW the performance is better there) but addition of ballast just kicks you over the edge.

You have two choices, start with the unbal-

lasted trim a bit forward of where you have it, or add the extra ballast at a position forward of where you now put it. I'd be willing to bet that the suggested ballast location is at the NORMAL c.g., and NOT at the rearward c.g. usual for your style of flying! Wanna bet?

Try moving the c.g. forward in the unbalanced condition, and then - when you add those 4 oz. - you'll revert to a rearward c.g., and be flying the way you like ...but with the c.g. within its rearward limit. Otherwise, contrive a way to add the extra ballast at a location forward of where you now put it. QED! JHG

From The Workshop: Fiberglassing Wood Fuselages

After the careful construction and sanding of a balsa/ply ...by Bob Welwood fuselage, applying fiberglass to it for strength and finish can often prove to be a frustrating experience for some of us. But if it's done nicely, it can be a real source of pride. Here's a method of doing this that I tried some years ago and still continue to use...

First, cut your cloth (usually 1 to 2 oz. weight) a little bit over-size and apply it directly to the prepped fuse with a fast-set C.A. Start on the top and work your way around & down, applying drops of C.A. every 1/2 in. or so (more is often needed around compound curves) and ensuring that the glass gets bonded directly to the wood surface. Continue applying the cloth until you get to the bottom. You will find that if you work carefully, you can do fillets and curves quite nicely. Just briskly rub the glass onto the wood with your fingers while the C.A. sets up. Trim the glass with a razor blade as needed. You should be able to get the glass on quite smoothly and at a nice comfortable pace (relax, enjoy, and take your time, as I do). This method solves the problem of glass cloth "creeping" all over the place instead of staying where you intended. When you've finished applying the cloth, the hardest part has been done.

Next, thoroughly mix up a generous batch of Hobby epoxy Formula II epoxy glue (the slow set stuff), thin it just a little with alcohol, and paint it right into the glass with a stiff brush, making sure to fill the weave completely and evenly. Start at the tail and work towards the nose, or vice-versa. Try to get a very THIN layer of glue on the surface for sanding later. Now, let this set up for at least 2 days. The glue must be fully cured before anything else can be done. Then, break out the 2, 3, & 600 wet sanding paper, a pail of warm water with some dish soap in it, a comfortable chair, a good light source, some relaxing music and work carefully at getting a nice and smooth surface. But, try to avoid sanding into the glass itself. This process usually takes about an hour or so, depending on fillets, etc. I sometimes follow up with a second coat of glue and sanding session before applying paint (maybe, because I really do enjoy the wet sanding process).

There you have it...perhaps not the cheapest or fastest way, but there's no odor problems for us indoor builders with fussy wives, and I've found that the resulting surface takes any kind of paint finish nicely, is flying-durable, and not too heavy.

'Another Country Heard From'

Dear Jim:

This letter comes to you from south central Nebraska. Here in central Nebraska, most of our soaring is geared toward thermal flying. I did, however want to send this picture of my last vacation to Costa Rica this January.

Having been to Costa Rica twice before (where my folks are semi-retired and living in mountainous coffee country overlooking the Orosi Valley) I could see that their home would be an excellent soaring spot. This year I got smart and took along a Culpepper CHUPEROSA and discovered the world of slope soaring!

This last week, we discovered that our sand hills in NE work just fine, too. If you can slope soar in NE, you ought to be able to slope soar about anywhere — with the right 'plane.

Best regards, (signed) Steve Loudon, 504 North Washington, Lexington, NE 68850



Steve Loudon and father with beautiful Orosi River valley in the background. Sailplane looks like the CHUPEROSA mentioned in Steve's letter.

Response: Steve, thanks for your letter. What a spectacular view, and what magnificent country! Sure would be nice to be there, too, and try that slope. Bet it's one of the best anywhere. JHG

Another Dodgson fan writes in about the Lovesick....er, ah, (sorry Bob) LoveSONG.

Dear Mr. Gray:

Enclosed is my renewal form and check for another year of RCSD. I enjoy reading RCSD every month, and it keeps getting better and better! The new format, typeface and laser printing are BIG improvements. Squinting is reduced considerably...but just promise not to get too 'slick'. The down-home, personal style of RCSD and the high information content per page (few ads) is unique. Keep it that way if you can.

I am in the midst of building a Dodgson WINDSONG+; actually, Dodgson calls it a 'LOVESONG', but I find the WINDSONG name much more appealing. Maybe it's because one of my first loves, back in the 60's, wore Windsong perfume. Don't know, but anyway, just got the wing spars glued into the foam cores. Lots more to do.

The WINDSONG is quite a different project for an old balsa basher. All this epoxy and polyester and fiberglass and foam stuff takes some 'getting used to.' That bead-board foam is fragile and generally a real mess. Ever tried to sand it? Dodgson's instructions are fairly comprehensive, but lack some details and cautions for the first timer. He believes in saving paper - uses even smaller print than RCSD used to have! Buy a magnifying glass with your WINDSONG+. Also, (there are) virtually no diagrams and no photos. The kit quality in terms of plans and parts cut to size is ok, but not great. Quality of the materials provided is very good.

Anyway, WINDSONG+ construction is a challenge, but it will be well worth the effort. I know, because some kind and trusting soul let me fly his Windsong last summer. Fantastic! It seemed to generate its own lift, and didn't want to come down. I was 'sold' - wonder if he gets a commission from Dodgson?

Keep up the good work, (signed) Waid Reynolds, 12448 83rd Avenue South, Seattle, WA 98178

'Another electric booster'

Dear Jim:

I was happy to see your note in the March '89 Soaring Digest that mentioned Electric-Powered Sailplanes and the need for them.

My own experience with these electric-boosted sailplanes has been that, at first, I was preoccupied with the design and engineering of the electric boost systems. But, since these things have become cheap, good performers and pre-engineered, (I'm thinking here of systems like the Graupner "Speed 600" system for the electric UHU, and their 3-meter Sailplane Boost System) I now take them for granted and am interested only in how the Schuemann wing or the Eppler 222 Modified airfoil works. In other words, I'm right back to soaring.

Best regards, (signed) Jim Martin, Hobby

Lobby International, Inc., 5614 Franklin Pike Circle, Brentwood, TN 37027

Response: Thanks again, Jim, for your inputs on electric-boosted sailplanes and soaring. I agree that most pilots will eventually look upon it as just another launching system (and probably a better one) than the one they used before. There is always some irrational (and some rational) resistance to change. On the plus side, electric boost will greatly simplify launching, yet on the minus side there are still objections to battery weight extra flight-system complications, and the need for recharging batteries every fifteen min. or so. There is still much room for simpler and lighter systems, and you are in an ideal spot to help bring that about! Keep on plugging (ar, ar). JHG

More On The LAROS...by Jim Gray

Readers, I'd like to tell you a bit more about Ferdi (as he prefers to be called). He's very busy with a new publication on radio-guided floatplanes, having finished two years ago a publication reviewed in RCSD and titled Aerodynamics and Design of Sailplanes. Additionally, Ferdi is completing construction of his 1942 design LAROS (meaning seagull in Greek) which he's adapted for radio control. An ad for the LAROS plans appeared in the Feb. issue. Ferdi says that the original flew beautifully, "right off the board", and it won several contests. Some fliers in Northern Italy also built LAROS from the plans, and a company, Aeropiccola from Turin, sold the drawings and "materials" package — what we call today a "semi-kit". The free-flight LAROS had a long and slow glide path which he assures us the radio-controlled version will retain - at least as far as gliding angle, if not speed, due to the increased weight.

Ferdi works with SAM Italia, the Society of Antique Modelers which have chapters throughout the world. He is editor of the newsletter Old Timer Gazette which is included in the magazine Modellistica. Ferdi says that about 40% of the SAM Italia fellows build free-flight models (gliders, rubber and power) and that the radio-assisted ones are usually powered. But, more and more often they are sailplanes.

He also built 80% (on a Sunday) of a Bostonian free-flight called the BOSTON KID — a small rubber-powered job of the Bostonian class...and an article will appear (along with plans) in the April '89 Modellistica. A copy of that plan was also attached to Ferdi's letter.

In my review of Ferdi's book, I stated that the book could be used for the preliminary design of full-size aircraft — and someone has done just that! The Ministry of Defense in Italy publishes the Aviazione Giovani through its aviation department, for distribution to the youngsters. Ferdi has a contract to design and prepare plans for other (model) planes for them: free-flight, R/C power, large R/C sailplanes & electric-powered sailplanes! He says it will take him about 2 years to complete the project. As you can see, Ferdi Gale' is one busy fellow — and he's in his late 60's or early 70's! I look upon him as the Frank Zaic of Italy, and a treasure of a human being who has single-handedly done so much for aero modelling. One final fact: he was instrumental in beginning and continuing the International Symposium on Free Flight, and he was also involved closely with designing, and building a low-velocity wind tunnel for measuring aerodynamic behavior of airfoils.

Dear Jim,

Having noted what appears to be a growing interest in F3B-type multi-task soaring, I'd like to express a few views from a European standpoint.

To clarify, I'm British, and relocated to Houston from Italy where I lived (and flew) for four years. The beauty of our hobby (sport, passion) is that wherever you go in this world you will find fellow fliers. When I arrived here at the end of '87, contact was soon made with a local group of sport-flying soarers. My arrival on the scene was something of a revelation: not because of my piloting abilities but, rather, due to the type of models and equipment I use.

Since '83 I've flown almost exclusively all-glass moulded machines produced by my friend Roland Sommer of Rowing, West Germany. Once one has experienced the performance, quality and strength of this type of ship, it is - for me - unthinkable to step back into the 'dark ages'. I should add that I'm a family-bound individual who, like most of us, has to try to cut a balance between what we'd really like to do and playing out the role of husband and father! That is, I'm essentially a weekend fun flier.

So why fly sophisticated competition machines, you ask? Simply because they offer more fun and enjoyment than 'floating' duration soarers. They are all-weather machines which don't go backwards or get tossed all over the place in 25-mph winds!

Currently, I fly a stable of IMPULS F3B machines: weight 7 lbs., loading 15 oz./sq.ft.; and an LS-4 scale ship: weight 13 lbs., loading 26 oz./sq.ft. To get them up high, I have an Italian-made 3.5-hp winch as used by the Italian F3B team and the equal of West German equipment. The line is 1.4-mm (.050") monofilament. Of course this is now illegal in view of the new motor limitations, which I am against for the following reasons:

1. Anyone interested in F3B-type flying has already acquired a similar 'illegal' winch. Mine cost \$300, and now I'll have to spend more if I want to make it legal. (Does anyone know how to measure the internal resistance of a motor, and how it can be modified?)
2. Remember that line pull (tension) has already been limited by the 'weak link', but it didn't reduce launch heights!
3. Powerful winches are required for large, heavy scale ships.
4. Models will not change dramatically in F3B circles. If anything, designers will seek to maintain strength AND reduce weight, which will probably make models even more sophisticated and costly!
5. Even with reduced winch power, I believe serious boys will still attain very high launch altitudes by refining present techniques.:
 - a. by pre-tensioning the line to its limit (can be done against the brake and doesn't require a high line pull under power). The high release tension provides the necessary stored energy to accelerate the F3B 'brick'.
 - b. With flaps down, relatively little power is required to maintain a fast, steep climb. My winch has only one speed, and I dab the pedal intermittently. The West Germans have speed control on their equipment, and drop the speed during climb to minimize the amount of line reeved onto the drum.
 - c. When the climb flattens off, the flaps are neutralized or given a few degrees of reflex. At the same time, the winch is hit flat out (fastest speed on a variable-speed winch) to obtain maximum speed when diving to make a 'ping' release. During this phase high power is not required; however, SPEED is the key factor.

The outcome of the new winch rules will be more expensive, I believe:

to change/modify existing motors to incorporate speed variability

to introduce a 'gearbox' between motor and drum.

Let's now turn to the discussions about increasing F3B participation in the USA. F3B, or re simply, multi-task soaring is the most pleasurable way of spending the day in the field, be it in competition or simply fun flying. Once I overcame the psychological barrier of weight and speed, I find my IMPULS easier and more enjoyable to fly than an out-and-out duration model, because:

you can 'ping' off the top of a launch without worrying if the wings will 'clap hands';

you can cover so much more air space;

the model is highly responsive and does what you tell it to do, and when you tell it to;

you can play with the variable camber to give a wide speed range;

'butterfly' (crow) with flaps down and ailerons up, will keep your walk to a minimum when you land out!

In summary, the features which are mandatory to compete in high-level F3B are also a source of enormous pleasure and variety if one flies just for fun! Incidentally, the strength built into these models does make for longevity. I'm not an 'ace' but have only had damage problems twice in 5 years:

cracked a fuselage on rocks when slope soaring in the Italian Alps (couldn't throw into all that lift!);

broke a fuselage in two last year when a tired aileron linkage finally gave up during a 'speed' run.

They cost more but last longer!

I'm against the idea of inventing a simplified F3B class. I think it far better to stay with the two basic flat-field types of soaring; namely,

Duration and Multi-task. My impression is that interest in multi-task is already there. What we need is more competitions of this type. Once bitten by the bug, fliers will automatically go for models which can cover distance and produce a turn of speed. The West Germans maintain a high level in F3B, not because they are better, but because they are more interested. They have well over 100 regular F3B fliers. They have meetings every weekend for their three categories of ability. They fly as TEAMS, and NOT as individuals...and they practice so much.

As the proverb goes: 'A thing worth doing is worth doing well.' The key to increased interest in F3B in the States will be the success of your team at the World Championships, and your boys will do it provided:

they equip themselves with competitive models and equipment;

they practice as flying TEAMS at least every week. Each flier must have his dedicated three assistants to launch and call for him, and to let him concentrate on CONSISTENTLY getting the best out of his machine.

I WISH YOUR TEAM EVERY SUCCESS. If they make it, you will see a huge following develop as a result. US models will proliferate as a result of demand, and costs will reduce to a more reasonable level. Next year could see high-tech machines affording simple fun for happy weekend fliers.

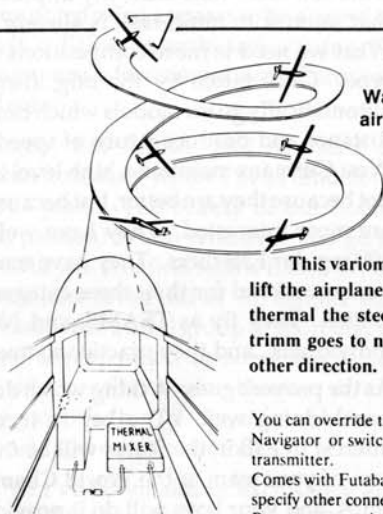
Sincerely, (signed) Dave Dunlap, 5118 Greensprings, Houston, TX 77066

P.S.: Don Edberg started discussions on the new F3B winches, but didn't finish! Let's try to get some more ideas on what the new winches should look like.

Response: Very interesting, Dave, and you have made some good points — even if I DON'T agree with you about NOT establishing a new multi-task class. Don, we'd sure like to have you finish your discussion about winches. How 'bout it? JHG

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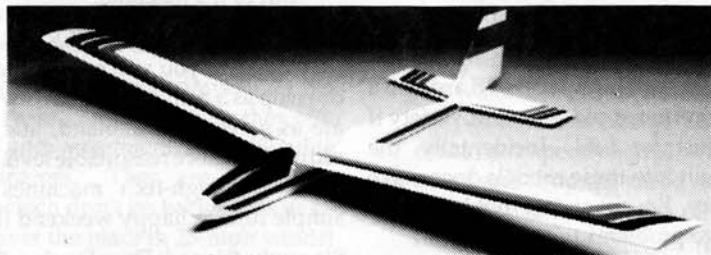
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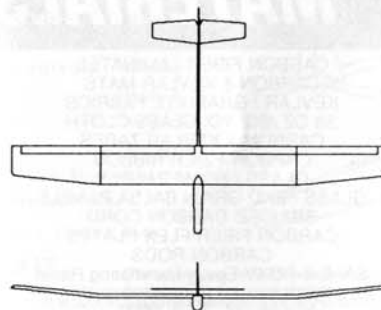
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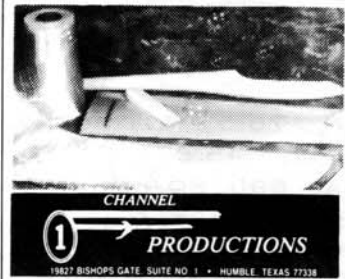
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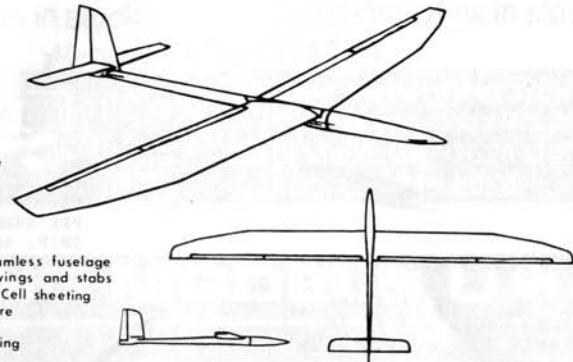
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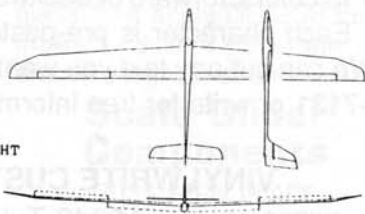
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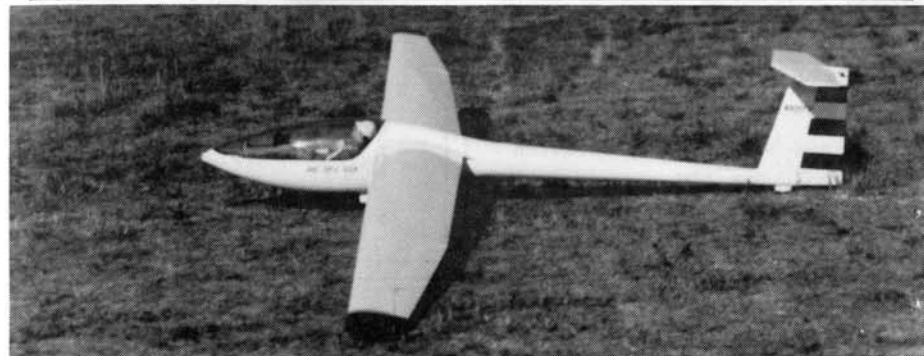
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