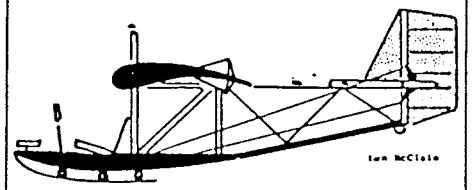

THE VINTAGE SAILPLANE ASSOCIATION

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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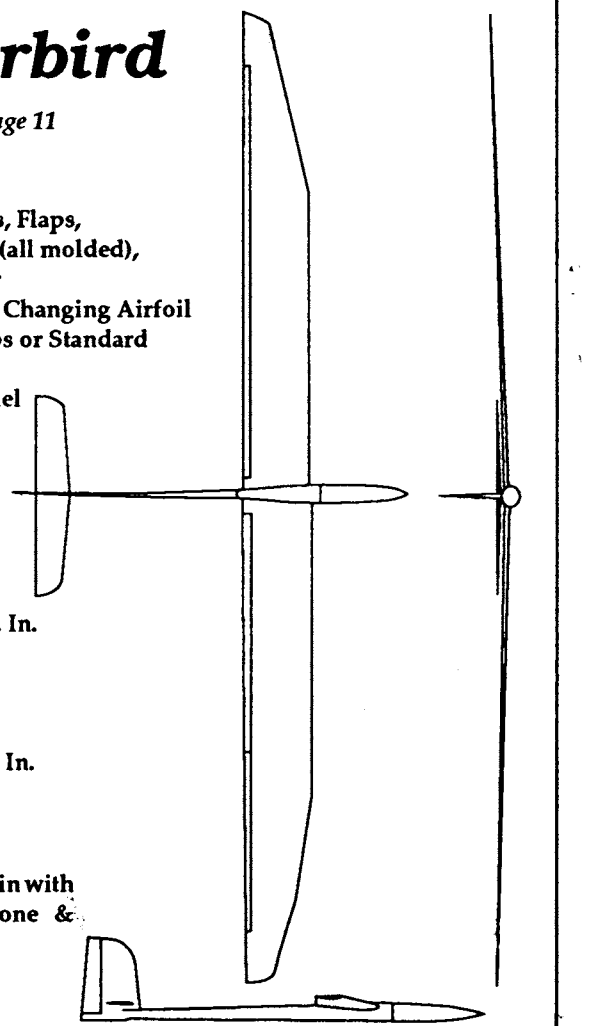
R/C Soaring DIGEST

Vol. 6 No. 6 June, 1989

Thunderbird

Featured on page 11

Functions:	Ailerons, Flaps, Rudder (all molded), Elevator
Airfoil:	Camber Changing Airfoil Via Flaps or Standard Airfoil
Radio:	4 Channel
Length:	61 in.



Thunderbird I

Wing Span	136"
Wing Area	1156 Sq. In.
Aspect Ratio	16.00

Thunderbird II

Wing Span	144"
Wing Area	1224 Sq. In.
Aspect Ratio	16.94

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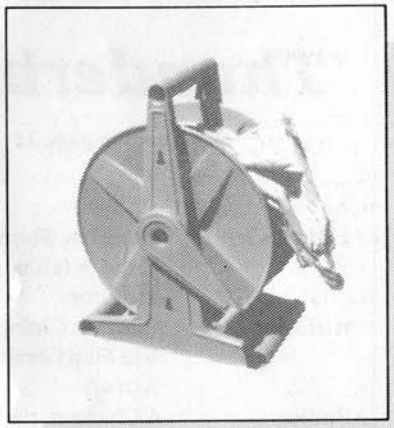

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High Start

From the ceiling of my office hangs a tiny stick-and-tissue sailplane called the BABY GULL. Its gull wing spans only 35", and its color scheme is orange (fuselage) and yellow (wing). It was built as a surprise for me by my good friend Bob Gracey of Morristown, Tennessee, from plans originally conceived in 1947 by Englishman Gordon Rae.

I've flown the BABY GULL with good success, but am afraid to give it a proper (stout thread on a spool) towline launch for fear it will get away. It's lines are "classic" pre-WWII, with an enclosed cockpit and nicely "gulled" wing a la MINIMOA, REIHER, and other vintage sailplanes. Recently, Bob called to tell me that he has finished a 70" span GAMMA GULL and is about ready to begin a 12-foot span GREATER GAMMA GULL whose 14" chord and consequently large area is likely to provide "a little shade from the Tennessee sunshine" as Gordon said in his recent letter.

Having received some additional information about the Gull series, I thought you might like to know a bit more about its origins and perhaps its destiny...so I quote from my friend Sean Walbank's column 'Silent Flight' in the June '86 issue of the English magazine R/C Model World. "Gordon was flying gliders (free flight of course!) with great success, back in the late 1940's and he thought that readers of R/C Model World might be interested in his GAMMA GULL design — what he calls vintage with a difference."

"The history of this design is very interesting. In 1947 Gordon designed a 35"-span model called the BABY GULL. For 1949, he followed a fairly common course of action and doubled up on the design to create the GAMMA GULL ('Gamma' was Gordon's RAF nickname). Like many of us, since then he had been seduced by the sheer, undiluted elegance of gull-winged gliders such as the MINIMOA, and so the GAMMA GULL naturally followed this plan form. In this guise, and with the larger of the two fins shown on the three-view, the GAMMA GULL took first place in the 1949 RAF No. 23 Group free-flight Championships at Wittering. Later, it was modified to incorporate polyhedral and a smaller fin."

"We now move on to 1984 when Gordon built a replica which he modified to take two-function R/C. Even with the radio, this modern version still comes out at only 8 oz./sq.ft. wing loading, yet its original Gottingen 436 airfoil section allows it to penetrate quite easily on the slope. Perhaps this is a section that would bear closer scrutiny for more modern designs? One other point of interest is that the original model had a three-piece wing...very trendy for 1986 but way ahead of its time for 1949!"

Well, readers, we'll see just how that 1949 GAMMA GULL flies when our friend 'Tennessee Bob' flies it this spring. We'll be even more interested when we see how the GREATER GAMMA GULL (a la Monokote Overcast) flies in its finished twelve-foot form! A couple of other interesting points here, readers: all versions — from 35" to 144" spans are made from balsa wood in the 'traditional' manner that has since come to be considered antique if not archaic. Did you know, f'rinstace, that many English sailplanes (er, sorry, chaps)...GLIDERS are still covered with tissue? Would you believe that some are even covered with TWO layers: the first of tissue and the second either a film covering or silk and dope! True, and it makes for a tough, resilient, and easily-repaired model, too, besides which it reduces the 'sag' between ribs!. Also, who'll be first over here to try that Gottingen 436 and report to RCSD about its performance?

My BABY GULL still 'flies' from its suspension string whenever the office window is open to the breeze, and even more vigorously when the ceiling fan is turned to 'low!'.

Happy Soaring,
Jim Gray

Electric Currents
...by Felix Vivas

Following on from my last column, we left off at folding props. Two fellow F3E team members and I used high-performance folding propellers from K&W Enterprises of Philadelphia, Pennsylvania, at the FAI F3E (electric gliders) World Championships last August at Parks Air College in Cahokia, Illinois.

The propeller should be sanded glass smooth using fine sandpaper, and balanced. The balancing is important and, if possible, you should use a High Point Products multi-use balancer. They're a little expensive, but well worth the price. A fine, smooth, perfectly balanced prop will reward you with a few hundred or more RPM's. If you're in a club, get a few interested pals to "chip in" on a co-op owned prop balancer.

Choosing batteries depends a little on whether area and weight are critical. If they are, then 800 mAH batteries are ideal. If weight and area are not critical, 1200 mAH batteries are fine. For peak performance, though, Sanyo 900 mAH batteries are the best for best power output-to-weight ratio. The SCR's have least resistance, giving you full power until they're out of "juice"...sort of like a race-car engine with square cam lobes.

As for battery chargers, you have Astro and Leisure who market excellent chargers. Before buying, consider whether it's better to purchase a charger that can charge at least twenty-eight 1.2 AH batteries, or a smaller one that can charge fewer batteries. Ninety-eight percent of model flyers who take up electric-powered flight usually move on from the basic 7-cell configuration to more power and larger aircraft, Hence, it's easier on the pocket book over the long haul to start with a charger that will cover present AND future needs...and it will save you from having to buy a second one later on.

This leads me to touch on transmitters and receivers for use with electric flight. More and more composites are being introduced into the construction of model airplanes and gliders...mainly gliders. Composites such as carbon and others, raise possible interference problems, along with potential motor interference, on your radio receiver. Also, the use of a speed controller to turn your motor on and off, or"throttle" it, dictates the use of an additional channel on your receiver and transmitter.

AIRTRONICS of Irvine, California produces State-of-the art receivers that are superior to anything else on the market. Again, give some thought to cost over the "long haul". Electric flying runs parallel to gliders: you always want a little better performance; i.e., four servos in the wings for flaps and ailerons, a speed controller, and elevator and rudder controls...requiring seven-channel equipment. Airtronics' "Vision" transmitter, too, is state-of-the-art, allowing you to change wing camber in flight, "crow feet" (ailerons up/flaps down) for precision landings, and elevator and flap mix to give you amazingly tight turns in speed and distance runs! Airtronics' Vision is not expensive when you think about it; as you build or buy increasingly high-performance aircraft, the "Vision" is capable of handling up to four set-ups in its memory. All can be set up for individual requirements, greatly simplifying the installation and use of functions in different aircraft. The "Vision" equipment is very cost effective.

Finally, I want to remind you that our F3B Team is going to the World Championships in August...and they are all using the "Vision" radio. I hope they will be successful. So, Go Get 'em, Guys!

Questions? Call or Write:
Felix Vivas
1800 16th Street H-310
Newport Beach, CA 92663
(714) 645-3263

B^2 Streamlines
...by B^2

RCSD columnists Bill and Bunny (B^2) Kuhlman have started a much-needed service. Here, let them tell you about It...

♣ ♣ ♣

Following a suggestion from Jim Gray, editor and publisher of R/C Soaring Digest, and with his continuing support and assistance, we are pleased to be able to announce a plans service created especially for the sailplane enthusiast: **B^2 Streamlines!**

Our intent is to provide a mail order plans service which is excellent in all respects. Starting with the best originals, we will be producing detailed blueprints on high quality paper and providing rapid turnaround of orders with our "in house" equipment. Customers will receive their blueline plans on heavy paper, made to order rather than duplicated in bulk.

At this point, we are building a library of original plans and looking for quality submissions from RC sailplane designers. Monetary compensation will be made for accepted plans. Monetary compensation is twofold: First, we will reimburse postage costs for each set of plans accepted. Second, each time a set of plans for that design is sold, payment will be made in an amount equal to $.10 per square foot. As an example, if the sailplane is a small slope ship that can be printed on a single 24" X 36" sheet, the designer would receive the postage reimbursement and $.60 each time an order for that plan is filled. Quarter scale sailplanes, needing more area, would generate a proportionally higher payment.

We are interested in obtaining construction drawings for sailplanes of all sizes and types — thermal duration, RC-HLG, scale, F3B and F3E, XC, slope, etc. Our blueprint machine will accept either vellum or mylar originals up to 30 inches in width and of any "reasonable" length. A brief description of a design needs to be sent to us before the plans themselves are forwarded. We will then, upon acceptance, arrange to have the originals sent to us.

Please share this letter with your fellow enthusiasts and designers; we're eager to hear about original creations and are looking forward to being able to provide the construction prints that modelers need! (P.O. Box 976, Olalla, WA 98359-0976)

GREATER DETROIT SOARING & HIKING SOCIETY 1989 SOAR-IN DUAL MEET

Host Club: Greater Detroit Soaring and Hiking Society; Contest Dates: June 24-25, 1989; Flying Site (see map): Ford Test Track; City & State: Utica, Michigan

Times:	Pilot's Meeting	8:30 A.M. (both days)
	Flying Starts	9:00 A.M.
Task T3	- Precision Duration - Six Rounds/Day - Ten Minute Maximum Flight - (1988-1989 Rule Book, Page 90, Section 13.3 thru 13.2.2.2, A-D)	
Scoring	- Precision Duration Flight Scoring Chart, 10 Minute Maximum Flight (1988-1989 Rule Book, Page 91, Section 13.3.2.6)	
Landing L6	- Graduated Runway (1988-1989 Rule Book, Page 90, Section 12.6.6)	
Classes	A. Novice	5 Trophies/Day + Overall High Points
	B. Sportsman	4 Trophies/Day + Overall High Points
	C. Expert	3 Trophies/Day + Overall High Points

Contest Director:
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(313) 477-2228

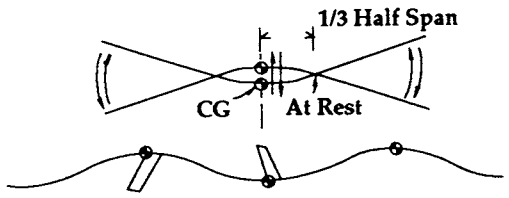
Frequencies: Only those radio frequencies approved per 1988-1989 rules; Launching Equipment: 4 winches & Retrievers; Awards: Trophies (see above), Plaques and Merchandise; Contest Fee: $9.00/Day

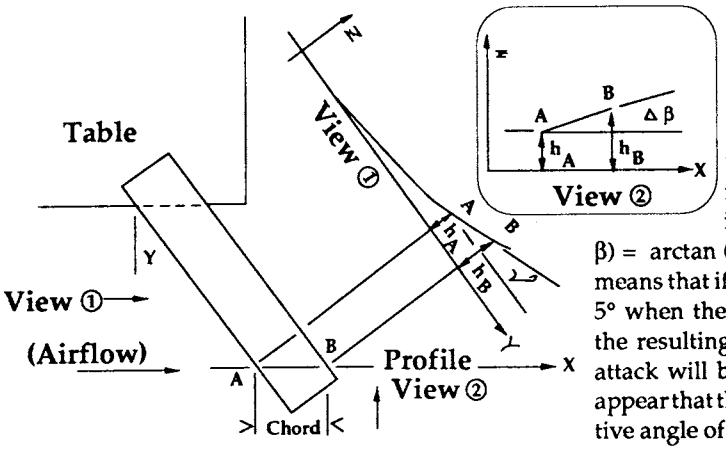
On The Wing ...by B²

Swept flying wings sometimes suffer from flutter at high speed due to a lack of torsional rigidity. The outcome of this flutter is either a reduction in flight speed or destruction of the 'wing. Dr. Martin Lichte has written an article describing both the flutter and a solution. Published in DELTA #6, the following is a condensation from the German text:

The first drawings show the type of flutter that 'wings can experience. Notice that the front view shows one point on each wing panel that remains motionless, while the side view, which describes the 'wing's path through the air, clearly illustrates the vertical movement of the CG.

Before a remedy can be prescribed we must find the reason for the flutter. Take a piece of sheet balsa and extend 3/4 of it past the edge of a table. "Sweep" the sheet to some angle relative to the table edge, say 20°, and place a flat object, like a book, on the end of the sheet which is resting on the table. If you now lift or depress the free end of the sheet you will see an interesting thing happen: the "angle of attack" of the tip changes, as shown in the next drawing.



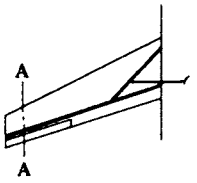


There is a twist imparted on the wing by the geometry of the bending. For the technically minded who might be reading this, the change in angle of attack ($\Delta\beta$) = arctan (sin γ * tan ν). This means that if you can raise the tip 5° when the sweep angle is 20°. the resulting change in angle of attack will be 1.7139°. It would appear that the increasingly negative angle of attack as the wing is raised would force the wing back down to where it belonged, but this is not what happens; rather, the wing flexes past the point of origin and continues downward due to inertia. At some point the increasingly positive angle of attack of the tip will force the end of the wing back up, and the cycle repeats. This bending of the wing is harmonic in nature and will increase in amplitude as long as the 'wing speed remains above the flutter threshold. Interestingly, the frequency of the flutter can be changed by changing the mass of the wing — increase the mass and the bending will occur more slowly, decrease the mass and it will speed up.

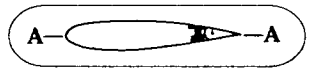
Tailed airplanes usually don't experience this type of flutter because of the tremendous damping forces exerted by the fuselage and tail assembly. This means that one of the most effective ways of dealing with this problem is to simply add a fuselage and tail assembly to the 'wing — but that would be cheating!

The solution to the problem does not lie in finding a new airfoil for the wingtip, as even a symmetrical section will apply a force to the wing as the angle of attack changes. An ingenious person may be able to come up with an electronic device to act as a damper, automatically moving the elevons to counteract the otherwise increasing amplitude of the bending and resulting torsion. Instead of taking up time, money, space, and weight with electronic gear it would be better to find a structural solution that could be incorporated during the building of a 'wing. Some reduction in flutter can be had by using winglets...but read on!

There is no way that all of the bending can be eliminated because there are no perfectly rigid materials, but we can use more rigid materials and place the rigidity where it will do the most good. The drawing below shows the solution presented by Dr. Lichte. The carbon fiber spar is placed well back, near the trailing edge, just in front of the elevons.



When the spar is placed to the rear of the airfoil it counteracts the torsion produced by the bending of the wing and the angle of attack of the tip is much more resistant to change. A fully sheeted foam core wing with this type spar system is very resistant to flutter even without winglets. A retrofit of this spar system would be very difficult in an existing 'wing, but what better reason to build a new one?



Dr. Lichte's article supported an idea presented by Ken Bates in The White Sheet #7 (February/March 1982). Ken's article dealt with some stability problems that he was experiencing with his swept 'wing designs, and he presented the idea of the rearward spar position as a means of controlling the torsion brought about by wing flex. Although Ken didn't talk specifically about this type of flutter, the underlying problem is identical to that presented by Dr. Lichte, and the solution is just as viable. Ken did mention some other alternatives: use (1) lots of taper, (2) thicker airfoils, or (3) lower aspect ratios. But each of these solutions has a negative effect which you might not want to deal with.

DELTA is the magazine of FSV Versmold, a West German club which flies only tailless 'craft. DELTA's editor is Reinhard H. Werner.

The White Sheet, edited by Sean Walbank, is the magazine of the White Sheet Radio Flying Club. This group is heavily involved in slope soaring, and their flying site is a hill overlooking White Sheet Downs, a short distance northeast of Sherborne.

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Bill & Bunny Kuhlman
P.O. Box 975
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98359-0975

News Flash!!!

Bob Dodgson's Newsletter: "SECOND WIND"

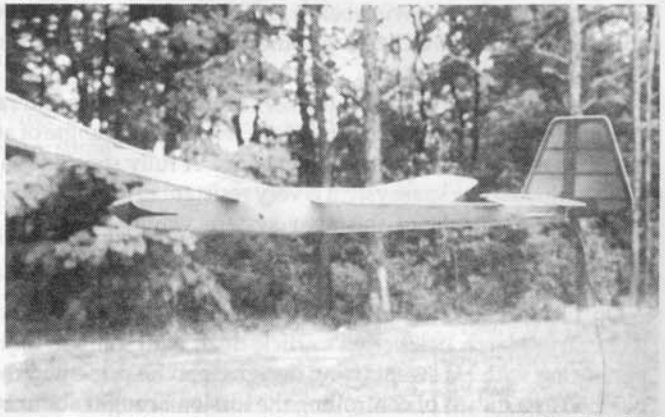
Bob Dodgson, designer and kitter of such famous sailplanes as TODI, MAESTRO, WINDSONG and many others has entered the publishing field with his bi-annual newsletter, just out. The 10-page newsletter contains a wealth of information of interest to the sailplane builder and flier. "Titillating Tips" is a column containing helpful ideas sent in by users of Dodgson Design products. Much of the issue is devoted to Bob's own reminiscences about his past, and discussions of his various sailplanes, including spec's and comments about the new ORBITER, a hand-launch sailplane designed by Eric Jackson, kitted by Dodgson Designs. In general, the newsletter is lively, interesting and very well done. To Order "SECOND WIND", send $1.00 to Dodgson Designs, 21230 Damson Road, Bothell, WA 98021. Oh, by the way, don't forget to tell him you saw it in RCSD!

Construction Of The "Feather"

...by Bill Rauch

References:
- MODEL BUILDER, May 1988 article entitled: FEATHER, by Nobel Kirkpatrick
- FEATHER Hand Launched Glider designed by Frank Green, MB Plan # 5881...$10

After having read the FEATHER article in the MODEL BUILDER magazine I knew that I just had to try my hand at building and fly'n this "Feather", my first HLG. I won't review Noble's article but, rather, explain how I constructed this HLG and came out only 1/2 ounce above the recommended flying weight of 8 1/2 ounces. I will inject some weight saving ideas that I incorporated which helped me attain this 9 ounce flying weight. (I'm sure some of you will incorporate additional weight saving techniques that will help bring this project out right-on-the-money.)



The FEATHER - One builder's approach to a super-light R/C HLG.

Basically, this HLG design incorporates a crash resistance that I like so that you don't lose the fuselage sides when you drag a wing tip. This is accomplished by anchoring the wing at the leading edge and holding it down at the main spar with a 6-32 screw into strong hardwood block that's well supported in the fuselage. The trailing edge of the wing will move while the wing absorbs the shock of dragging a wing tip and no damage has yet resulted to the airframe. This design has good rudder authority so that it can pickup that low wing on a downwind turn, making it easier to control for a hand catch type of landing. (This technique I am still working to perfect.)

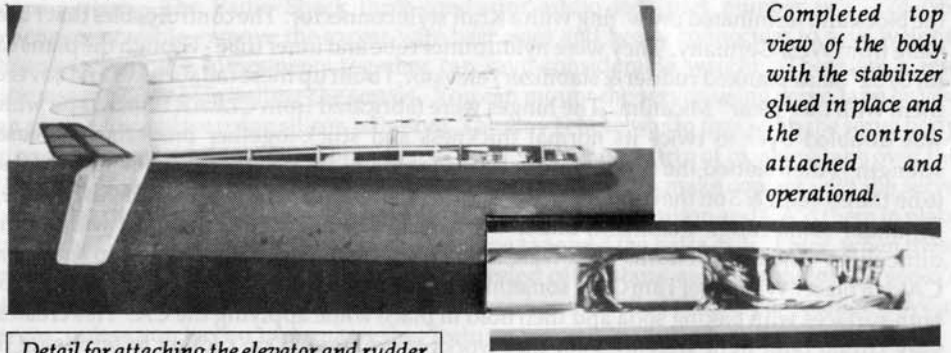
CONSTRUCTION - Fuselage, Elevator & Rudder

The trick here is to build "space" and make everything just barely strong enough to do its job. (I "scratch" build Old Timer's & powered sailplanes as a rule, and have been flying model aircraft about 50 years.) The first step, after receiving your MB Plan #5881, is to determine your wood requirements. Basically, you'll be using 1/64th plywood and balsa wood. A word about selecting balsa wood — the density of balsa can vary from 4 lbs. per cubic foot to 20 lbs. The strength of balsa is directly related to its density: the heavier it is, the stronger and harder it is. Eight to twelve pound balsa is considered "medium" or average weight and the most plentiful, while six pound or less is considered "contest" grade and is less accessible. Next, there is the balsa grain. The way the grain runs through a balsa sheet largely controls its rigidity or flexibility. For example, if the sheet is cut from the balsa log so that the tree's annular rings run across the thickness of the sheet (A-Grain, Tangent cut), then the sheet will be fairly flexible edge-to-edge. In fact, after soaking in ammonia water, some tangent cut sheets can be completely rolled into a tube shape without splitting. If, on the other hand, the sheet is cut with the annular rings running through the thickness of the sheet (C-Grain, quarter grain), the sheet will be very rigid edge-to-edge and cannot be bent without splitting. When the grain direction is less clearly defined (B-Grain, random cut), the sheet will have intermediate properties between A and C grain. Naturally, B-grain is the most commonly available and is suitable for most jobs. Generally, you will use B-grain for flat fuselage sides, trailing edges, wing ribs, formers, bulkheads, planking gradual curves & wing leading edges sheeting. You will find C-grain used for basically the same items as B-grain, but it is not as plentiful. (Note: C-grain is best for our HLG purposes, if available.)

The fuselage of the "Feather" is planked with 1/16" C-grain (6 to 8 pound) balsa. This has 1/64th plywood doublers added (to which I made lightening holes of 3/16" D throughout). The 1/64th plywood is applied to the 1/16" balsa with slow cyanoacrylate (CA). Throughout the construction I use the CA/3M77 pinless method of construction; that is, spray 3M77, lightly applied, to stick the plans to a flat, smooth work surface. Then spray the plans lightly and cover with waxpaper (not plastic wrap, of course). Now a coat of 3M77 on the waxpaper and we're ready to lay down parts and start construction. The fuselage is constructed per the plans back to the trailing edge (TE) location of the wing. When the fuselage sides are joined, the top and bottom fuselage "decks" are built-up and covered with 'clear' Micafilm. (This seems to me to be about the lightest finished covering available in today's market place.) The nose block (balsa) is hollowed out as much as possible and sealed with CA. While one fuselage side remains on the plans (which were copied via Xerox and, using the monoKote heating iron set on "high", (I) transferred the Xerox images to the balsa sheets...then cut them out accurately), I CA'd the bulkheads and the 1/4" balsa servo rails in place.

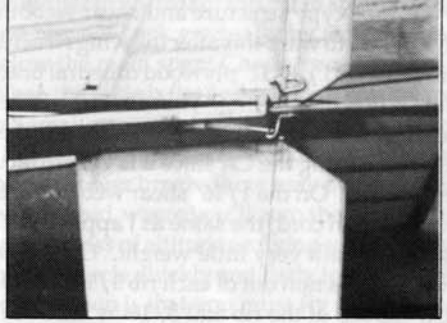
The bulkheads were reinforced with carbon cord (or carbon TOW) which was smashed with a hammer to spread it out thin and applied perpendicular to the grain, then CA'd in place.

...continued on page 8

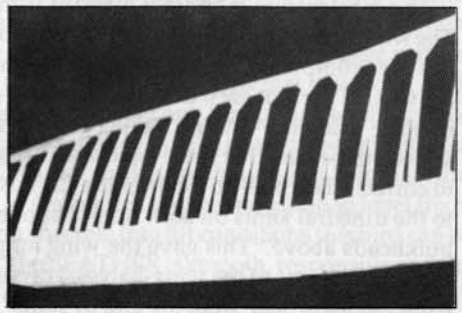


Completed top view of the body with the stabilizer glued in place and the controls attached and operational.

Detail for attaching the elevator and rudder control surfaces...also, note the antenna wire exiting from the last bulkhead just before the rudder.



(Above) Fuselage as seen from the bottom before attaching the planking.
(Below) Wing Detail.



The radio, servos & battery were tried out to see if they would fit properly. The other side of the fuselage was then attached (with the other 1/4" balsa servo rail properly located) to form the outside of the body. The nose block was attached and the forward access cover was fabricated and custom fitted to the fuselage. The plans called for a 70 mAH battery pack constructed from a 9 volt nicad battery (taken apart and removing 4-cells to make up this 4.8v battery). Instead, I choose the 150 mAH 4.8v battery from SR Batteries Inc. for their security and durability/dependability (since I have used their batteries before with tremendous success, even when the batteries were over 5 years old and neglected). A note of warning: before attaching both sides of the fuselage together, make doubly sure that the bulkheads are wide enough to accomodate your receiver and the space consumed by the control cables as they pass through the compartments beneath the wing. I used a Vanguard (Royal) 4-channel receiver, without case, surrounded by soft foam rubber and placed up front in the nose, followed by two Kraft KPS-18 micro-servos, followed by the SR 150 mAH battery, and finally placed a three-conductor audio jack (replacing the normal switching harness and its associated weight) from Radio Shack, which weighs almost nothing when the jack is removed and the receiver/servos are operating normally...this unit is a normally closed variety and wired into the battery pack on one side and the receiver on the other. This unit can act as both a charging jack and an "on-off" switch when used with the sub-miniature phone plugs. I put a piece of ribbon several inches long on the plug so I'd not be tempted to launch this bird with the receiver OFF. Now, having removed the heavy radio connectors and excess wire harnesses, I wired everything directly up to the Vanguard Receiver's block...Here, I mounted the block and terminated my wiring with a Kraft style connector. The control cables that I used were from West Germany. They were nylon outter tube and inner tube. Though the plans call for 3/32" balsa planked rudder & stabilizer/elevator, I built up these tail surfaces and covered them with the "clear" Micafilm. The hinges were fabricated from CLEAR Scotch tape which was doubled over to twice its normal thickness and stuck-together providing increased strength. I then slotted the two mating balsa surfaces and slipped these tape-hinges in-place (6 on the elevator & 3 on the rudder), CA'g them in place permanently. These hinges have held up under some rough treatment, under worse than normal flight situations, without any difficulties. The control horns used were made from small paper clips, bent into shape and CA'd in place. Whenever I am CA'g something of this nature (metal-to-wood or plastic), I coat both surfaces with baking soda and then hold in place while applying the CA. This creates a very strong (and light weight) bond that works every time. Don't forget to terminate the rudder slightly above the base of the fuselage to permit the antenna wire to exit from the body at this point.

CONSTRUCTION - WING

The construction is straight forward using a "D" tube-type structure and shear webbing. The wing tips are built-up with a 1/8" washout. (Don't try to warp this after the wing structure has been completed. For the wing, at that point, is very rigid.) 1/32" plywood dihedral braces are used, 2 each, at each dihedral joint and center section of the wing. These braces are held in place using the CA and baking soda treatment...You'll never have a problem with these joints, but be sure that these joints are correct before applying the CA since it is very difficult to correct a botched-up job after the CA has been applied. On the 1/16" shear webbing, next to the dihedral joints on both sides, I applied more carbon cord, the same as I applied to the bulkheads above. This gave the wing ample strength with very little weight. On the two inboard portions of the wing-halves, I carved the center section out of each rib 3/16ths" back from the main spar webbing and 3/16ths" below the top of the rib and 3/16ths" above the bottom of the rib. It is at this point that you can add the 1/32" C-grain balsa for the leading edge sheeting back to the spar. I found that there was no need to sheet the bottom of the wing from the leading edge to the spar, thus saving some weight in this department. A soft piece of trailing edge balsa stock can be used to make the tip panels of both wings, but be sure that you DO NOT omit the 1/32" balsa wood wing rib gussets, as they contribute considerable strength to the wing. An important point concerning the elimination of the center cut-out of the wing ribs...be sure that you CA the inside edges after removing the center section. This imparts additional strength without any weight penalty. When covering the wing, use 'clear' Micafilm and cover the bottom first. Pull the Micafilm tight in all areas but do not heat-shrink yet, rather (since the airfoil profile is under-camber), attach the Micafilm to each rib using the iron and, when satisfied, apply CA along the joint made between the rib and the Micafilm on the bottom of each rib. This will also add considerable strength to the wing and prevent the Micafilm from pulling loose, thus changing the shape of the airfoil in that location of the wing. Now, cover the top of the wing with Micafilm. When this is complete, heat-shrink the entire wing alternating top and bottom of the structure assuring no warps occur.

CONSTRUCTION — RADIO INSTALLATION

As previously mentioned, I use my Vanguard (Royal) 4-channel receiver, without plastic case, surrounded by foam rubber and located in the forward compartment. This brought the CG perfectly within the specified main-spar location. For those interested, there is a light weight (new) Futaba R2H receiver on the market that weighs .77 ounce together with their S-33 servos, which weigh .6 ounces each, making these components good candidates for the on-board system. The Radio Shack three-conductor audio jack part number is : 274-296. Whenever possible, remove the excess wire harnesses and heavy connectors to save weight. Directly wiring the components together can save considerable weight. There are a few different methods of installing the servos. You can mount the servos using servo tape or you can glue them in place using silicon adhesive. The way I chose was to first wrap the servo body on each side with CLEAR Scotch brand tape. Next, I attached a strip of masking tape over the CLEAR Scotch brand tape (overlapping) where the servo's sides make contact with the servo balsa rails. I located the servos between these rails in their final position and CA'd them in place so that the CA only made contact with the masking tape and the balsa rails. Later, when these servos are removed, the masking tape can be peeled off without any marring of the servo's plastic case. (NOTE: be sure that you have checked and verified the proper rotation of your servos, unless you have a transmitter that features reversible servos.)

FLYING

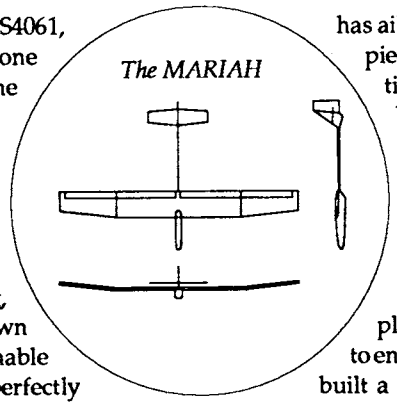
Employing these various weight saving techniques, you should now weigh-in about 8 1/2 to 9 ounces and be right-on-the-money with your CG somewhere between the front edge of the main spar to the rear of this main spar. I'd suggest starting with the CG in the forward position and move it back gradually by shifting the batteries which are located in the compartment below the main spar. Check for warps and test fly on a windless day over a grassy surface. When the glide is flat and straight, you are ready to give the FEATHER its first hefty toss. Trim in a small amount of down-trim on your transmetter to prevent any "zooming" tendancy into a high angle overhead stall and throw this bird up at about a 45° angle, straight away from you, into whatever breeze there may be. It should climb in a straight path until just before it runs out of speed where you'll zero the elevator trim to permit this bird to transition to level flight without loss of altitude or flying speed. When you stumble into lift conditions this bird can be made to circle quickly and flatly into the bubble. The FEATHER is smooth, responsive and the only caution is that you must fly it fast enough to maintain flight *...continued on page 20*

A Kit Review: The Mariah

...by Brian Agnew

Every once in a while a design comes along which, because of its own uniqueness and departure from the mainstream of things, soon establishes itself as a classic. The WINDFREE, AQUILA, BIRD OF TIME, SAGITTA, WINDSONG, and the PRODIGY are all classics. I believe that Ed Berton of Competition Products has designed a 2-meter that may soon be a classic. Ed has been designing and developing his MARIAH for over 3 years and just this year has released it in kit form.

The MARIAH is available in two versions: either with a fiberglass tail boom or with a carbon fiber boom. While the carbon fiber is lighter and stronger, it is also a good deal more expensive. If you want a fuselage that can fly through a brick wall, get the carbon fiber. Otherwise, the difference between the two is negligible. Since the MARIAH tends to come out a little nose heavy, the slightly heavier fiberglass boom won't hurt you. If you opt for the carbon fiber boom, don't run your RX antenna in the fuse but in the wing per Ed's instructions.



The MARIAH

The MARIAH sports a S4061, has ailerons and flaps, a pod and boom fuselage, a clean one piece wing with a flat center section and dihedral in the tips. The wings are foam and are sheeted with 1/16" balsa; the tips have 1 degree of washout cut into the cores. The MARIAH is an extremely clean ship with an excellent speed range and superb handling while on the step, thermalling, or landing.

The kit itself is the highest quality I have ever seen. The packaging, wood selection, instructions, and the CAD drawn plans are top notch. Ed has taken every step imaginable to ensure that when the building is done you have as perfectly built a sailplane as humanly possible. For instance — there are actually two sets of foam core wings supplied with the kit: the actual construction cores and what Ed calls the "full-size" cores. The full-size cores are cut to the final shape of the wing and are used as a mold to hold the construction cores in place during the sheeting of the cores. The full-size core beds fully support the trailing edge of the wing, the end result if a perfectly straight trailing edge that is as sharp and as strong as can be. Ed even provides high density balsa used specifically for the trailing edge so that it comes out strong and resists warping during covering.

The only instance in which I deviated from Ed's instructions was in the application of the balsa skins to the cores. There are at least five different and equally effective ways of doing this. Ed recommends 3M 77 spray adhesive. I chose to use epoxy. It's mostly a matter of using a technique you feel most comfortable with. If you've never skinned foam cores before, use Ed's method and you can't go wrong. If you use epoxy, be careful to avoid excessive weight.

The wings are held to the fuselage in a rather unique fashion. They are held on with a nylon bolt — but rather than having the bolt go through the top of the wing and into the fuselage, Ed has it go through the bottom of the fuselage into the bottom of the wing. The mounting is blind; there are no protruding bolt heads.

The fuselage has plenty of room for almost any size radio. With mini-servos and careful planning, a releasable towhook can also be fitted. There is probably room for a Thermic Sniffler, but not if a releasable towhook is installed.

Flying the MARIAH is an absolute joy. It handles beautifully. The center of gravity seems too critical with the S4061 — it should be flown anywhere in the 38-42% range — depending on where you can fly it the smoothest. The flaps are very useful when thermalling...they help slow the plane down and allow it to be flown in tighter circles until the MARIAH is practically standing on a wing tip. The plane is an absolute dream to hand launch and will go up in the smallest of thermals. Spot landings are unreal — with flaps/elevator compensation, the MARIAH responds in a positive fashion all the way to the spot — accuracy is limited only by the pilot's ability.

To sum it all up, the MARIAH is a high-performance 2-meter ship that is limited only by the pilot's ability. It's flight is docile yet aggressive. While it would make an excellent first aileron ship for someone who wants to transition from polyhedral to ailerons, it should not be considered a beginner's project. It must be remembered that the MARIAH is a total design concept. After years of development, Ed Berton has designed every aspect of the MARIAH for a specific purpose. Modifications should be made at your own risk. I highly recommend the MARIAH for those intermediate to expert builder/flyers who are looking for the extra performance that so often makes the difference. The high quality of this kit is reflected in its price — but compared to other kits, it is really a bargain.

Brian Agnew
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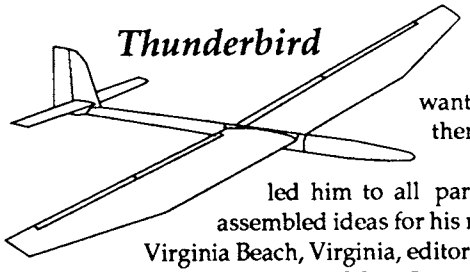
Palm Beach Gardens, FL
33418

Thunderbird



About four years ago Ray Olsen, Arizona land and business developer, decided he wanted to take F3B building techniques and apply them to a high technology thermal design airplane. This airplane developed into a QUEST that has led him to all parts of the world, where he met with experts and assembled ideas for his new plane, the THUNDERBIRD. Herk Stokely, Virginia Beach, Virginia, editor of SOAR TECH, encouraged him to pursue the concept. Dr. Helmut Quabeck, West German designer of the HQ airfoils and several F3B designs, helped with the moments on the nose, tail, and wing planform. Ray contributed to the wind tunnel tests at Princeton and out of discussions, with Michael Selig and John Donovan, came airfoils for fully camber changing wings. During this process, Lee Murray of Appleton, Wisconsin, helped design the laminar flow nosecone. He did the laser cutting and computer work on the templates, also. Final design refinements were completed by Ken Stuhr of VS Sailplanes, Seattle.

The THUNDERBIRD should bring about new levels of flying, made possible by the aerodynamic research from Selig and Donovan that has been designed into the entire airplane including the vertical fin, stabilizers, wings, and fuselage. Taking advantage of new lightweight composite materials, it is a potent combination for an exciting flight experience.

The airplane's removable nosecone offers easy access to the radio equipment. The flaps and ailerons are driven by servos in the wings. The double taper wings come in two forms, built-up or all composite. The airfoil is a new Selig and the elliptical tips use a different airfoil for better style characteristics. Flyers can expect light wing loadings.

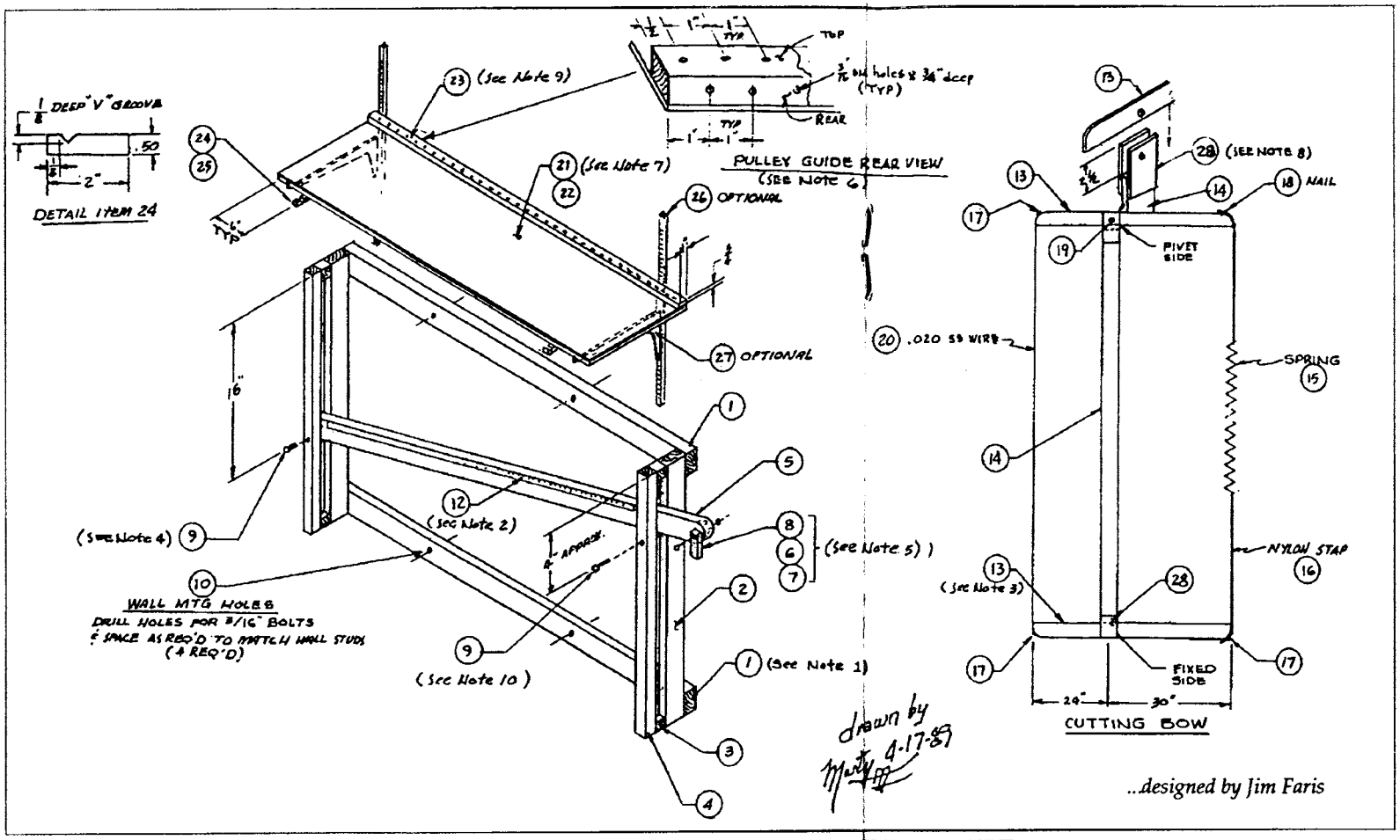
All the plug and mold work and the manufacturing of the airplane is being done by Ron and Karen Wagner of HI PERFORMANCE SAILPLANES, 17902 NE 156th St., Woodinville, WA 98072; phone: (206) 487-1721.

Kit Features fiber glass pressure bagged one piece fuselage, blue foam cores for the wings and stabilizers, choice of balsa wood or HP Cell sheeting for the wing covering, basic hardware. Price: $250.00 plus COD shipping

Mariah...continued

Automatic Foam Cutter

Channel 1 Productions



Material List

#	Qty	Description
1.	2	1*2*44"LG Wood
2.	2	1*2*24"LG Wood
3.	4	1*1 Wood Spacer
4.	1	1*1*24"LG Wood
5.	1	1*2*48"LG Wood
6.	1	3/16*3" Bolt
7.	1	3/16 Nut
8.	1	16 oz. Lead Weight
9.	2	3/16 Bolts
10.	4	3/16*2.5"LG W. Screws
11.	1	Wood Glue or EQLT.
12.	1	Metric Tape
13.	2	1/2*2*6" Suppots
14.	1	1/2*2*54" M Support
15.	1	Door Spring
16.	2	Strap
17.	3	Wood Screws
18.	1	Nail
19.	1	3/16 Screw
20.	60"	.020 Wire
21.	1	3/4*16*52" Plywood
22.	1	1/32*16*52" P. LAM
23.	1	3/4*1*52"LG Wood
24.	2	Bow Support Block
25.	2	Wood Screws
26.	2	Wall Mnt. Bracket
27.	2	16" Shelf Bracket
28.	4	1/4*2*6" Block for Item 14

News Flash!!!

"Making Foam Cores and Cutting Templates"

Channel One Productions has their new 89-minute tutorial on "Making Foam Cores and Cutting Templates" — and a really interesting tape it is! Sure, sure, I know that you can cut cores with your hands behind your back and blindfolded, but - even so - you CAN learn something, as I did. Along with the tape I received a very nice sketch and plan for making your own foam cutting machine and a set of full-size patterns for making templates of the Eppler 374 airfoil. With that kind of start, almost anybody can succeed.

The video is for beginners as well as experienced modelers, and would be an ideal opportunity for your club V.P.'s and Program Chairmen (sorry, gals, I just can't bring myself to say 'Chairpersons') to bring some interest to your meetings and to stock the club library with another useful hand's-on look at the right way to make templates and cut cores. To order the video, see the ad later in this issue for Channel 1 Productions, 19827 Bishops Gate, Humble, TX 77338; telephone: (713) 540-3944, or (713) 443-1253.

Notes

1. *Glue item 1-4 with item 11.*
2. *Glue item 12 (metric tape) to pivot arm. Use bolt hole as 0.*
3. *Glue item 13 (bottom support) to item 14 (bow support) with item 11.*
4. *Drill hole for 3/16 bolt thru items 4, 5, & 2.*
5. *Drill hole for 3/16 bolt thru items 8 & 5.*
6. *Drill 3/16 holes for offset as shown on top & rear of item 23.*
7. *Glue item 22 formica to item 21 plywood with contact cement.*
8. *Nail or glue item 28 to item 14 as shown.*
9. *Glue or screw item 23 to item 22 as shown.*
10. *Drill hole for 3/16 bolt in line thru items 4 & 2, only.*
11. *Drill 3/16 hole thru items 14 & 18 (pivot side, only).*

A Modest Proposal
...by John Iafret

Preview: The contents of John's thoughtful proposal make it too long to publish in its entirety, but I'd like to present the gist of it here, with the hope that you will be inspired to write him — or RCSD — for further information. John sent his proposal to the soaring columnists and editors, the NSS, the AMA, and the LSF with the hope that it will elicit comment and provoke further thought. In a very condensed version, here's what John had to say (paraphrased and abbreviated). If there are any errors, my apology, as the mistakes will be mine and not John's.) ♣ ♣ ♣

SUBJECT: (1.) A series of thoughts on the adequacy of plane vs. pilot as a method of determining classes. (2.) A proposal to use the turnaround as an equalizer of launch systems, especially for FAI, but also for AMA contests. (a) ...there are several clubs attempting a beginner-to-expert contest classification...but am not aware of any official organization setting standards or acting ... on a national level to assure success of a national ranking system. The Greater Detroit Soaring and Hiking Society (is) going to hold two major contests this year (June and September) using a PEOPLE classification rather than a PLANE classification. (b) I see no problem in designing the technical and equipment architecture from an electronic and mechanical standpoint...

BACKGROUND: For the last several years there has been a drop in the number of contestants in the Michigan area...a trend that has followed other maturing sports....As the sport matures, the leaders...get stronger and stronger, making it more difficult for the beginner to find an entry into the fun area of competition...without the ability to get into the...mainstream of the sport at a level commensurate with ones peers, initial interest dies rapidly.

I am afraid (the model sailplane sport) has matured to the point where the beginner has no hope, yet we consistently run contests graded upon the wingspan of the sailplane and not on the... skill of the pilot. (There is also) an inequity of design and building techniques within a wingspan rating. Alas, the beginner is matched up with the 'Mario's and Unser's of the modelling world.

The 1988 LSF Regional in Detroit had 7 Level V's out of 22 contestants, and most others were high Level IV's and a goal or so away from Level V. What Level I or II in his right mind is going to donate money to the trophy fund of this elite group...let alone be beaten in a 'no-contest' lineup? If you believe this as I do, perhaps you will help evolve this great sport into its next logical growth stage — one that provides a grading program for the pilot and NOT for the Plane he is flying...a program that will encourage the beginner to come to the party and have fun competing with his peers and not all the Level V's in the area.

The proposal here is not tough and it is not new. The basic premise is being used by several national groups with varying degrees of success, and we therefore have a model to look at and improve upon if possible. I believe the system should grow from a local area to work the 'bugs' out before being proposed nationally. I would like to see the effort coordinated by the Michigan Soaring League with help from all member clubs and the implementation plan be an agreement of the MSL, NSS, and LSF. The program may take several years, but as long as all fliers know there is progress being made, I believe they will experiment and support the effort...

PROPOSAL: **(A) Reorganize the sailplane enthusiasts into FOUR competitive classes...BEGINNER, ADVANCED, EXPERT, AND MASTER...OR USE THE LSF AS THE RANKING STANDARD. Some reworking would be required...because what do you do with a good flier who is not a member of LSF? (B) The national ranking would be administered by the NSS (which) would have the authority to advance a contestant from EXPERT to MASTER... (C) The State organization would have the authority to advance a contestant from ...ADVANCED to EXPERT...(D) The local participating club would have the authority to advance a contestant from BEGINNER to ADVANCED...**

THOUGHTS TO PONDER: (1) What does a Level V do to keep his interest up? ...Cross-country or FAI? The program should allow growth into these areas after Level V. (2) The BEGINNER should be protected from really advanced aircraft...therefore it may make sense to discipline the aircraft as well as the pilot. (3) ...Wing loading could be the rough equivalent of engine displacement...I'd suggest an aircraft classification system based upon...wing loading and area...a combination of which could define 'beginner's ship'...(4) ALL beginners would be required to use these aircraft parameters...but none of the advanced (or higher) classes...

KEY IDEA

A ... universal plan (would) define PILOT AND LAUNCH SYTEM...THE KEY IS TO DEFINE THE INPUT ENERGY TO THE PLANE (and let the pilot define his airplane and techniques to best suit his style for the round at hand. The analogy is that when he is out of 'contest-supplied energy' that is all he gets...I am suggesting that input energy may be specified for the different classes...perhaps only for the EXPERT OR MASTER CLASSES, as technology should be the driving factor in a driving factor in winning for the higher classes...something the beginner should NEVER have to worry about!

PHILOSOPHY: THE MASTERS class should be earned by the best...(who) should be continuously challenged by the best pilots and technology in order to earn the right to represent the USA in International competition. A selection process that allows the one or two contests to determine our national representatives just does not seem right...a long, consistent record of beating the very best in the USA should be the method used to select these great fliers. **(What about a "seeding" method whereby the top fliers in the USA "seed" each other in a ranking from 1 to 10, with the top 5 being chosen? JHG)** In International Competition, the equipment is as important as the pilot and the rules are really difficult for those who only want to have a good time in their local area...

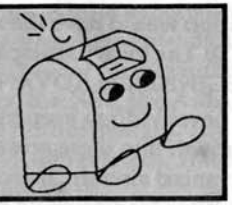
I have an idea that (may) provide a verifiable and controllable parameter launch system...A SYSTEM THAT MEASURES ENERGY GOING INTO THE PLANE IN A REAL-TIME MODE AND THEN FEEDS THAT INFORMATION BACK TO THE WINCH. The only place I can see that happening is the TURNAROUND...once you measure energy per second and feed it back...new possibilities open up.

♣ ♣ ♣

The remainder of John's thoughtful and interesting letter discuss just HOW such measurements might be made and what the feedback and control system might be. He also defines parameters for the energy measurement system. RCSD considers this to be the best and most original piece of thinking yet to come to light...one that has some hope of working as well as providing a LOGICAL approach to the problems of contesting at all levels. I am most interested to see the outcome and what the inputs and ideas of others may be. The technology exists and the means are within our grasp. Interestingly, John's proposals could possibly lend credence to the "ONE-DESIGN" concept introduced by RCSD last December. John, RCSD is behind you; what can we do to help? JHG

John E. Iafret
519 Boutelle Drive
Grand Blanc, MI
48439

THE GRAY AREA



First S3B/Sportsman F3B /Multitask Contest

Dear Jim,

I am delighted that R.C. Soaring Digest is having a multi-task sailplane design contest.

I agree that the scope of model sailplane design and contest flying needs to be expanded along the lines of the F3B contest. There is no doubt that the F3B movement has contributed substantially to airfoil design construction methods and radio equipment advancement.

I think that before we design a standardized sailplane, we need to develop a standardized contest. I think the multi-task sailplane contest, M.T.S.C., should incorporate the elements of the F3B contest, but should be an Americanized version. The existing International F3B competition seems to be comprised of constant bickering, rule changes, controversy, and law suits. The contests are expensive to stage, require many officials, and are difficult to run and score. In other words, F3B contests are hard work and no fun. I propose we develop a new type of contest called the American M.T.S.C. This contest should be easy to put on, be able to stage on most of our club flying sites, use a minimum of officials utilizing a simplified scoring system, and be designed to use most of our club field equipment.

Attached is a contest information sheet the D.U.S.T. club used at their recent M.T.S. contest. This contest was actually two contests in one. Task No. 2 can be any form of a precision duration, crash in the circle, three round contest, and all the contestants of both contests can fly at the same time. A man-to-man or call up to fly starting could be used as well. Any type of scoring system could be used assuming that a total of 3,000 points are awarded for Task No. 2.

The speed and distance task use a 100 meter course which will site fit most club flying sites. The F3B contests require a 150 meter course. The 100 meter course is the same as required for A.M.A. closed course distance records. The speed task has a maximum time limit which simplifies scoring and establishes a goal to fly towards rather than head-to-head competition. The greater the maximum time, the lower the "tech" a sailplane must be, and the slower and safer the course can be flown. The distance task also has a set number of laps as a goal for the same reason. Attached is a picture of a hoop type sighting device which we developed to be used for the speed and distance task. These are easily stored and transported and can be set up in about 10 minutes by one person. The accuracy of this lap sighted equipment, and the absence of multiple official timers decrease the accuracy in flying the 100 meter course. However, pilots who fly under the required time and required distances...their scores would not be affected.

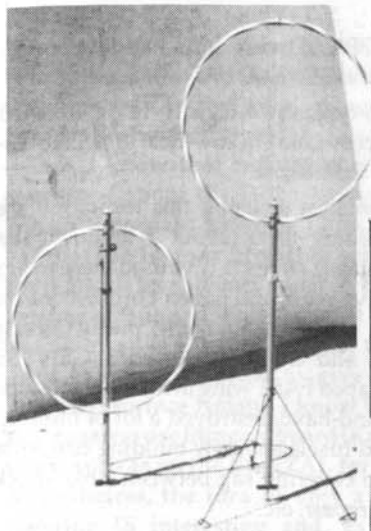
The minimum official personnel needed is two for the speed event. These are a timer/sighter/flagman, and a flagman/sighter. The minimum personnel for the distance event is two, which would be a flagman/sighter and a flagman/sighter/lap counter. Other officials would be a contest director and a registrar/scorekeeper. The pilots and their assistants would act as flight timers and man the winches and retrieval systems.

The equipment such as winch motors, drum sizes, towline types, battery types, and turnarounds could eventually be standardized to minimize the differences between club field equipment. The use of retrievers could be used for all three tasks at the contest director's discretion.

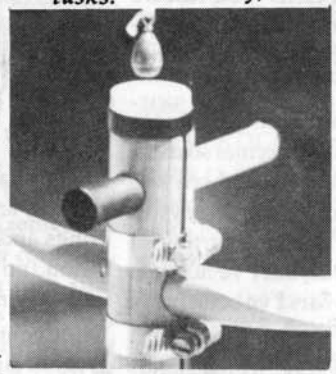
The soaring system puts more weight on the thermal/landing, task 2, than the other two tasks and, I think we Americans tend to enjoy this task and, it should count more.

I feel that sailplane specifications should be established to match the contest format, and to reduce the cost in technical requirements that occur in the F3B competition. In addition, the sailplane specifications should be structured so that the "unlimited" F3B plane would not normally qualify to fly. I suggest that class "C", 100 inch wing span with a minimum wing cord of 10 inches at the root and a minimum wing thickness of 10% of the cord, a minimum wing loading of 10 ounces, ballast to a maximum wing loading of 16 ounces, could be established. The fuselage cross section might be limited to a 7 square inch which would allow room for standard servos and radio equipment. The control functions could be limited to four servos, two servos for the rudder elevator functions, and two servos to be used for two of the following: flaps, spoilers, or ailerons. All functions may be mechanically or electrically mixed. Captive and releasable tow hooks would be disallowed.

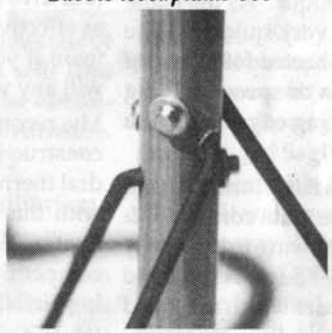
I feel that contests which measure the model's and pilot's performance are the forces which expand and advance our hobby's challenges. I offer this version of the D.U.S.T. M.T.S. contest as a starting point from which a refined American M.T.S. contest can be evolved.



Sighting hoop for speed and distance tasks.



Bubble level/plumb bob



Support Legs Detail

Sincerely yours, (signed) George J. Ritter, 73 899 Highway 111, Palm Desert, CA 92660-4068

Response: Readers, this is regarding the contest spoken about in the above letter. Yesterday, I received a call from Rex Powell co-CD of the meet, and he has agreed to write a complete report for RCSD. This was the first of the "RCSD Challenge" contests, as far as I know, and was attended by pilots from beginners to accomplished contesters—and ALL had a GREAT and FUN time! Apparently, the contest formula was so successful that there is a popular request for more just like it. Far from being intimidated, the beginners (Gentle Lady, Oly 650, etc.) joined in the fun and flew all of the tasks including the dreaded "speed" task, and enjoyed it! RCSD is looking forward with keen anticipation to the contest report. Meanwhile, Rex submitted the accompanying photos of the sighting device used to mark the turn "gates". This device is simple, and worked very, very well with a minimum of personnel needed. Exactly what seems to be required to make it easy and fun for an average club to hold a multi-task contest. Incidentally, all rounds were flown and finished, and awards given by 3 PM! Good work, CD's and D.U.S.T. In appreciation, RCSD is planning to award RCSD subscriptions to two pilots chosen by the CD's as being representative of this "first". I sincerely hope that this will become a "model" for S3B events, and encourage readers to contact Rex at the above address. JHG

BANZAI!

Dear Jim:

I just received the January issue of RCSD and would like to thank you for the excellent coverage of the BANZAI slope soarer. As yet, there hasn't been much response, but I'm sure it will only be a matter of time. You feature different gliders on the cover of your magazine; how would I go about getting such a feature? **(Easy, just ask. JHG)**

I also wrote to tell you about a few techniques that I will be using in my new thermal soarers. Referring to your December issue, there was an article about spars and spar strengths. Well, I've taken the idea one step further. I don't know if it's a new idea, but I've not seen or read about it in the 10 years I've been in the hobby.

The technique is called 'FAST' which stands for Foam And Spar Technique. As the name says, these wings build very quickly. The wing incorporates an unsheeted foam core of white or blue foam, balsa or spruce leading edge, a shaped balsa trailing edge, and balsa or spruce spars.

The foam core is cut with a flat (blunt) L.E. and T.E.; i.e., like power-plane foam cores. L.E. & T.E. strips are glued to the wing using epoxy or CA plus a foam primer. The core is grooved top and bottom for the spars which are glued in using epoxy or CA+.

In a polyhedral wing, the center panels need a spar top and bottom, and a spar on the bottom for the outboard panels. These can be glued and reinforced with fiberglass tape, or made removable in the usual manner.

This building technique is applicable to almost any type of wing. I prefer to use it in polyhedral wings with 'flattish' bottom airfoils. Undercambered airfoils cannot use this technique. I've built wings using 9% flat bottom airfoils, and the Selig 3021 and Eppler 205 and 374 airfoils. All have been successful: strong, durable and reasonably light. Depending on the type of conventional wing structure you choose, the FAST technique can save a few ounces...for example, on a Bob Martin BOBCAT wing...or add a few ounces such as on a GENTLE LADY wing.

My wings typically weigh 10-14 oz. finished and covered, using a low-heat film like Solarfilm or Econokote.

The advantages of using this technique are quick building time (about 2 hours to the covering stage), strength (I've used these wings for over five years and haven't broken one on a launch yet - using some pretty strong winches), and durability (used a GENTLE LADY-shaped FAST wing in full-contact slope combat, and have destroyed a lot of built-up wings and fuselages), low building cost, true airfoil (no covering sag between ribs), quick and easy repair, etc.

Disadvantages include limitation to certain types of airfoils, difficulty of installing spoilers (but dive brakes can be installed, and are just as effective), and the possible crushing of the foam if you hit something very hard (but so will any wing crush under heavy impact).

My recommendation is to use this type of construction on 2-meter or 100" span polyhedral thermal gliders. Because I've had success with this technique, I'll be kitting a thermal floater 2M of the Gentle Lady type, and a competition glider with a non-camber changing airfoil, in the not-too-distant future.

What do you think about this wing?

I've enclosed an updated promo letter for the BANZAI slope soarer. As you can see, our company is going to get into every facet of soaring — not just slope — if there is a demand. If you happen to have a 'pet' glider or idea you would like to fly or use, let us know. Maybe we'll kit it also.

Thanks again for the mention in RCSD, and continue the great work with the magazine. Sincerely, (signed) Jeremy Teo, Banzai Enterprises, 2997 Anderson Avenue, Port Alberni, B.C. Canada V9Y 2V3

Response: Jeremy, I am almost positive I have seen or used that kind of wing construction, but can't be positive. I worry about things like crushing of the foam which, even if covered with a light film, can be damaged. It is apparent that the foam itself serves as the shear webbing between upper and lower spar caps - a perfectly good idea, incidentally — but I know that readers will really be concerned about the lack of either a balsa and/or fiberglass sheeting. On the other hand, if the foam is protected well enough from attack by solvents (such as by using a coating of thinned white glue) it would be possible to use silk and dope, or tissue and dope to cover the wing to give it a little 'tougher' surface finish. I know that many slope soarers use thin cardboard (Kromekote) stock, such as on the BANZAI, for covering. Nevertheless, the idea of only a thin film covering IS interesting and, as you say, proven over five years of use. I sincerely wish you the best of luck and a LOT of response from RCSD readers.

Readers who are interested in full details of the BANZAI and other products will find the descriptive letter and price list obtainable from Jeremy to be very worthwhile. Write and see for yourselves. JHG

♣ ♣ ♣

Vertigo is more than a loss of equilibrium.

Dear Jim:

I am a pilot with Eastern Airlines so, since I am unemployed right now, I'm a little slow with my renewal. Anyway, I enjoy RCSD, but sometimes finish it at the mailbox!

I enclose a couple of pics (no need to publish them). One is a Sagitta 900 with 126" elliptical dihedral (a la Hobie Hawk) wings, and the other is a slope soarer I designed last year: 62" span, E-387, 12-oz. wing loading. Mark Tribes was nice enough to put it in MA last month.

My standard Sagitta flies better then the long-winged version, though. Guess I didn't put enough dihedral on the long wings, so it's a little sluggish in roll — but a 'floater' at about 1060 sq. in.!

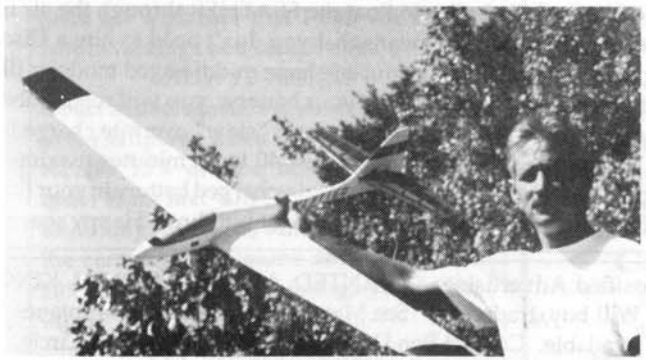
The VERTIGO is real a blast, though, and I'm about to finish another sloper: 48" span, low aspect ratio thinned E-205 wing at about 10 oz. wing loading. Should fly this week — will let you know.

Keep up the good work, (signed) Kirby Nelson, Route 5, Box 50, Warrenton, VA 22186

P.S.: Keep the RCSD Challenge SIMPLE and FUN!

Response: Kirby, I appreciate the pix and letter. I'll be waiting for a similar treatment for your new 48" sloper. Have you picked a name? By the way, your experience with the long-winged Sagitta reminds me of my own experience with the long-winged Hoobie Hawk...it wallowed into a turn and came out the same way. If you think the short-winged version had Dutch Roll, you should have seen the big one! It did have quite a glide, however, but slowly. V-e-r-y s-l-o-w-l-y. JHG

♣ ♣ ♣



Kirby Nelson and his "VERTIGO"...a beautiful slope machine done in red, white & blue

Dear Jim:

For many years our RC soaring club, the Capitol Area Soaring Association, has espoused and been involved in the LSF program. In fact, one of the reasons we sponsor monthly "tournaments" is to facilitate participation in the contest requirements of LSF. We believe the LSF program is one of the best methods of improving soaring capabilities. *...continued on page 20*

The Gray Area

...continued from page 19

We have been concerned for some time regarding the need to support LSF beyond the support it gains from the submission/processing of vouchers and have searched for ways to generate this. At our last club meeting we decided we would donate one half of our proceeds from our May tournament to LSF. While this will not be an enormous amount of money (perhaps $50), if each soaring club in the U.S. was to do something similar we believe the annual contribution to LSF could be sizeable. This would make the LSF a more viable organization and permit it to do those things it is not able to do now because of financial strictures.

We are sending this letter to all modeling magazine soaring column editors and hoping all will either publish the pertinent parts or otherwise mention the concept so it can get wide dissemination. Thank you for your consideration.

Good lift, (signed) Robert J. Biss, CASA Coordinator, 12504 Circle Drive, Potomac, MD 20854; CASA Message Line: (301) 933-CASA

♣ ♣ ♣

All's well that end-plates well

Dear Jim:

Regarding Bill and Bunny Kuhlman's article in the April '89 RCSD, I'd like to mention that when I installed split ailerons on my ASW-22, I used 'end plates' to cover the ends of the aileron halves. These were made from .050" aluminum sheet and were shaped to just cover the full excursion of aileron travel. I liked the idea of using fiberglass as presented in the article because I found that 1/32" plywood is just not stable enough to yield a first-class job. My original intent when I designed the system was to use it for full-span flaperons of the 'split-flap' variety (as opposed to the simple flap type). In other words, the lower half could be moved down while the upper half stayed put in the 'flap' mode.

Best regards, (signed) Jim Brock, P.O. Box 124, Amboy, WA 98601

Response: The idea of end plates is to prevent spanwise flow and turbulence (drag) on deflection of a wing control surface. Aerodynamically, they are useful, but mechanically somewhat difficult. Worth a try. 'Split' flaps leave the upper wing trailing-edge surface undeflected while permitting the lower trailing-edge surface to deflect normally. Not usable for 'reflexed' flaps, however. I've often wondered why this principle isn't used for ailerons! After all, the down-going aileron causes the adverse yaw, and in many cases, differential is so great that there is no downward aileron travel, anyway. Therefore, why not use a 'split' aileron that travels upward from the trailing edge surface, only? Anyone care to try? JHG

The Feather...continued

stability. So, keep your speed up, especially in low-altitude downwind turns. The joy of this HLG is that it will respond to very light-lift situations allowing a skilled pilot to float the FEATHER through the air like magic. The aircraft's small size and light weight means that you don't need to hire a Discus Thrower to do your throwing for you — the average out-of-shape middle-aged modeler (like me) can throw this HLG all afternoon. A hint regarding your battery: you will realize about 1 1/4 to 1 1/2 hour flight time on the 150 mAH cells if you use a "slow" overnite charge but, if a fast charge is employed, I wouldn't trust the battery past 40 to 45 minutes maximum. (Possibly, in this case, you might want to carry an additional slow-charged battery in your flight box?) This is a fast building bird and you should enjoy it. So, get building! Happy soaring.

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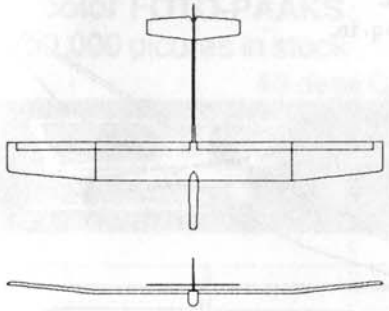

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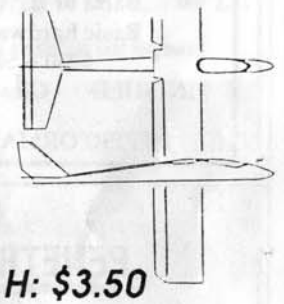

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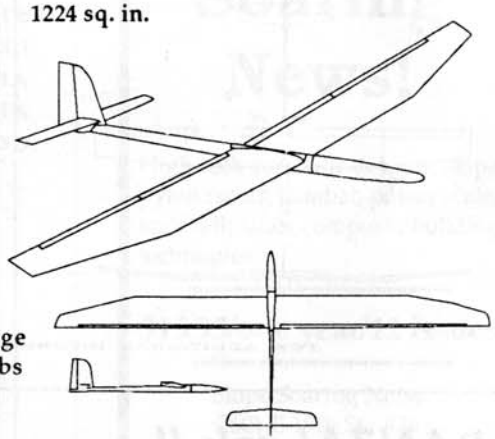

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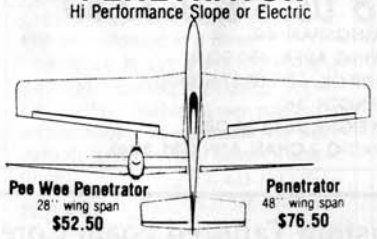

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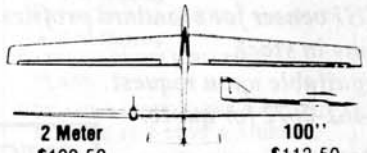

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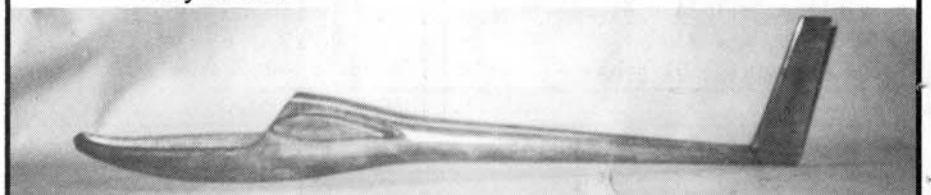

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