

THE VINTAGE SAILPLANE ASSOCIATION

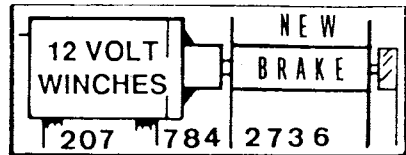
VSA is a very dedicated group of soaring enthusiasts who are keeping our gliding history and heritage alive by building, restoring and flying military and civilian gliders from the past, some more than fifty years old. Several vintage glider meets are held each year. Members include modellers, pilot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

For more information write:

Vintage Sailplane Association
Route 1, Box 239
Lovettsville, VA 22080

FLIGHT LINE SYSTEMS

P.O. Box 1502, Lewiston, Me. 04241



For Information Contact:
NSS Secretary/Treasurer
CLIFF O. IYER
8151 BROADWAY
SAN ANTONIO TX 78209

You are invited to join the
NATIONAL SOARING SOCIETY

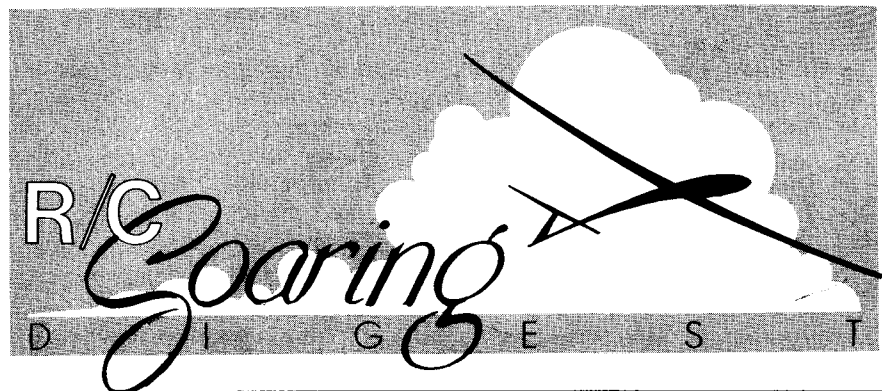
- OFFICIAL AMA SOARING - SPECIAL INTEREST GROUP
- YEARLY NSS - SOARING TOURNAMENTS
- NATION-WIDE EXCELLENCE AWARDS PROGRAM
- EXCELLENT BI-MONTHLY NEWSLETTER
- NSS FULLY SUPPORTS THE F3B SOARING TEAM & LSF SOARING PROGRAM
- NSS IS INVOLVED IN THE ORGANIZATION AND OVERSEEING OF THE SOARING PORTION OF AYA NATS (INCLUDING AWARDS BANQUET)
- YEARLY DUES ARE \$12.00 (SPECIAL FAMILY RATES)
- NSS OFFICERS ARE FROM ALL 11 DISTRICTS

RC Soaring Digest
P.O. Box 1079
Payson, AZ 85547

Bulk Rate
Postage Paid
Permit #17
Payson, AZ 85547

© 1989 RC Soaring Digest printed monthly twelve issues per year. Edited and published by James H. Gray, 210 East Chateau Circle, Payson, AZ 85541. Telephone number (602) 474-5015. Subscriptions \$17 per year in the USA. (Arizona residents please include 7% sales tax) \$21 U.S. per year in Canada & Mexico; \$26 U.S. per year via Air Mail in Europe in U.K. \$318 U.S. surface mail; and \$28 U.S. per year via Air Mail in Asia, Pacific and Middle East. (\$18 U.S. surface mail). All rights reserved. Reproduction with permission of Publisher allowed. RC Soaring Digest, RCSD, Radio Control Soaring Digest and Soaring Digest are registered names. The right to use RC in place of RC is reserved and registered for all above names.

ADDRESS CORRECTION REQUESTED
FORWARDING POSTAGE GUARANTEED



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

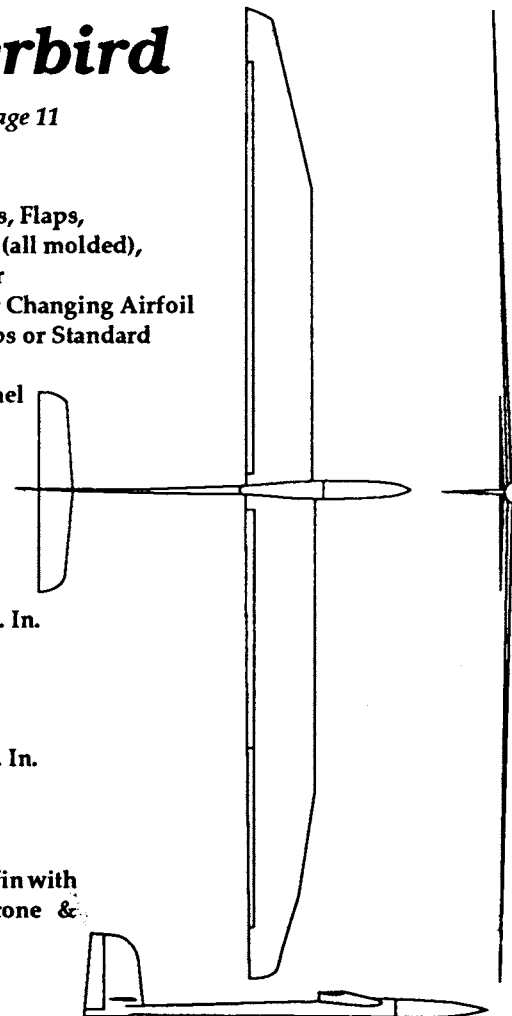
Radio: 4 Channel

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

Features a NACA vertical fin with
NACA removable nosecone &
elliptical tail boom.



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

B² Streamlines

...by B²

RCSD columnists Bill and Bunny (B²) 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: **B² 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.

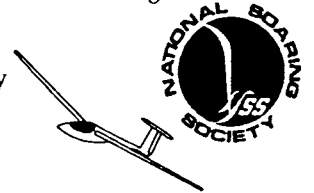
Task T3 - Precision Duration - Six Rounds/Day
- Ten Minute Maximum Flight
- (1988-1989 Rule Book, Page 90, Section 13.3 thru 13.2.2.2, A-D)

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

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

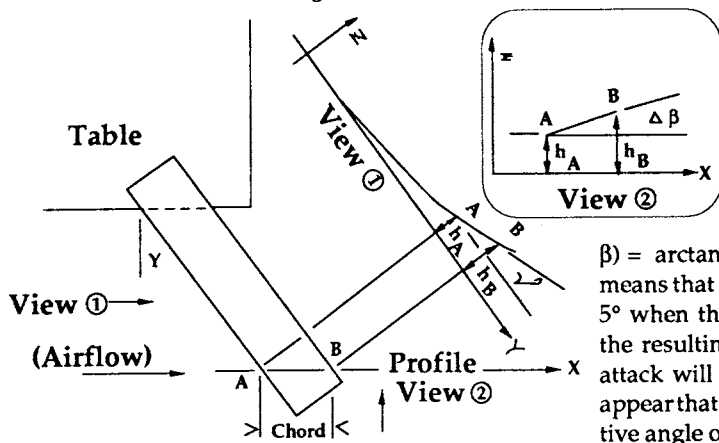
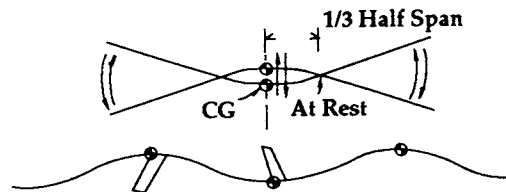


Contest Director:
Art Slagle 26314 Kiltartan
Farmington Hills, MI 48018
(313) 477-2228

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.

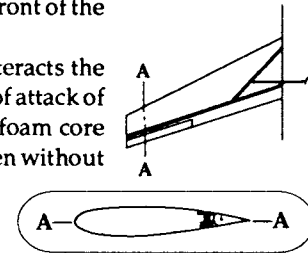
Tailed airplanes usually don't experience this type of flutter because of the tremendous damping forces exerted by the fuselage and tail assembly. This means that one of the most effective ways of dealing with this problem is to simply add a fuselage and tail assembly to the 'wing — but that would be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

Reinhard H. Werner
Schloerstrasse 4
4802 Halle/Westfalen
Federal Republic of Germany

Sean Walbank
29, The Gardens
Acreman Street
Sherborne
Dorset, England
DT9 3PD

Bill & Bunny
Kuhlman
P.O. Box 975
Olalla, WA
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!

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 outer 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 transmitter to prevent any "zooming" tendency 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 sports a S4061, boom fuselage, a clean one section and dihedral in the are sheeted with 1/16" are sheeted with 1/16" range and superb handling, or landing.

The kit itself is the seen. The packaging, tions, and the CAD drawn taken every step imaginable is done you have as perfectly

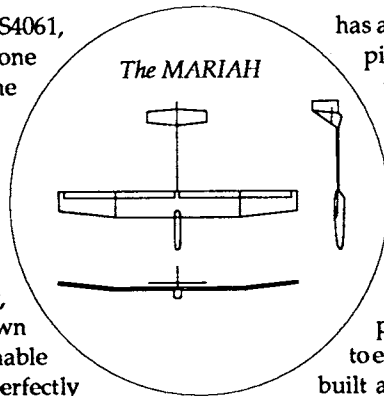
For instance — there are actually two sets of foam core wings supplied with the kit: the actual construction cores and what Ed calls the "full-size" cores. The full-size cores are cut to the final shape of the wing and are used as a mold to hold the construction cores in place during the sheeting of 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.

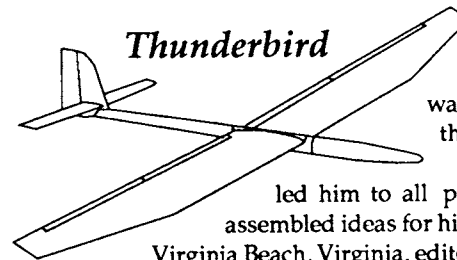
The fuselage has plenty of room for almost any size radio. With mini-servos and careful planning, a releasable towhook can also be fitted. There is probably room for a Thermic Sniffer, but not if a releasable towhook is installed.

Flying the MARIAH is an absolute joy. It handles beautifully. The center of gravity seems



has ailerons and flaps, a pod and piece wing with a flat center tips. The wings are foam and balsa; the tips have 1 degree of washout cut into an extremely clean ship range and superb handling, or landing.

highest quality I have ever wood selection, instructions are top notch. Ed has to ensure that when the building built a sailplane as humanly possible



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.

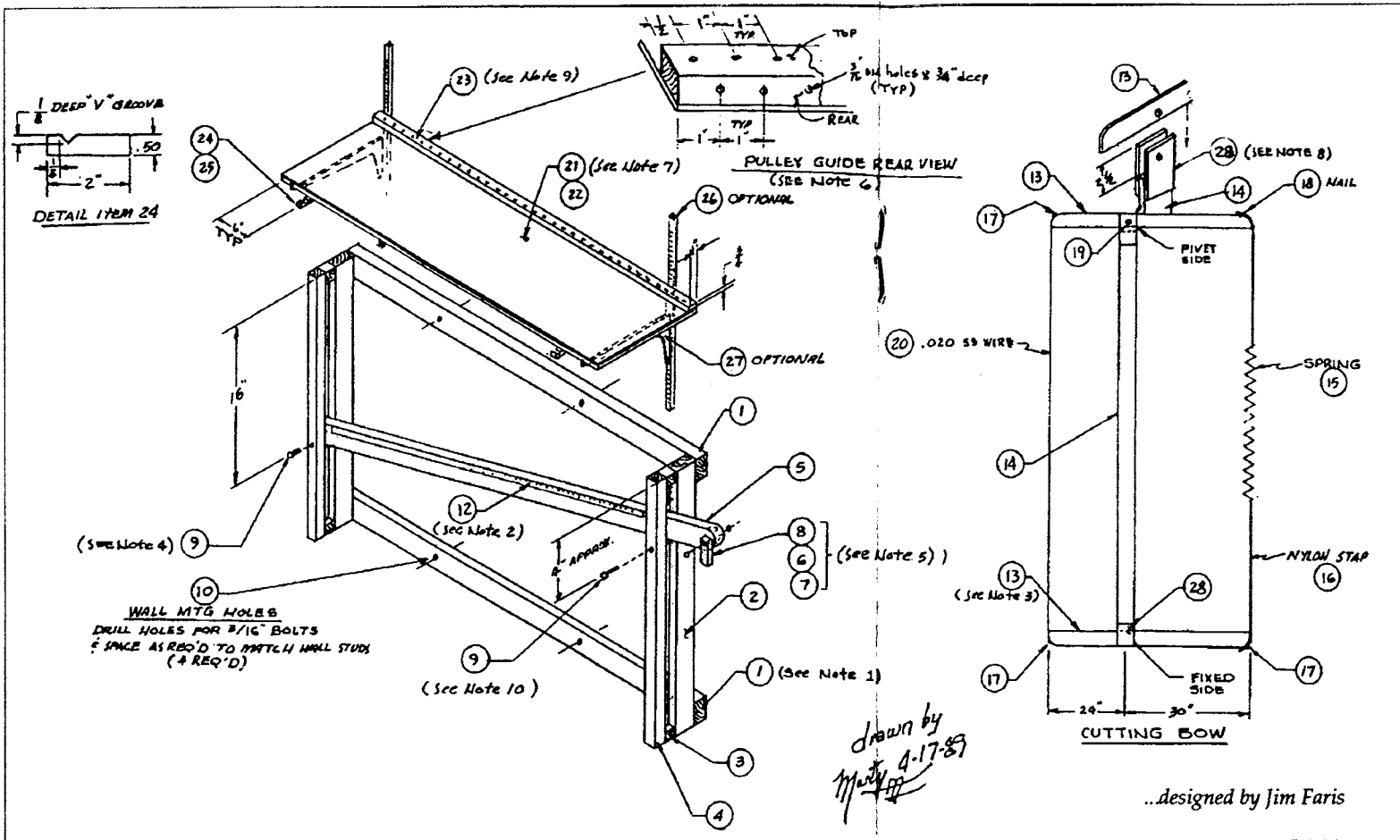
Kit Features fiber glass pressure bagged one piece fuselage, blue foam cores for the wings and stabilizers, choice of balsa wood or HP Cell sheeting for the wing covering, basic hardware. Price: \$250.00 plus COD shipping

Mariah...continued

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
6134 Kendrick Street
Palm Beach Gardens, FL
33418



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" Supports
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

drawn by
M. J. 4-17-89

...designed by Jim Faris

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).

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. lafret
519 Boutelle Drive
Grand Blanc, MI
48439

...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 mA 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.

Wm. R. Rauch
3756 Evans Trail Way
Beltsville, MD 20705

Classified Advertising: WANTED: Mueller THERMAL KING Will buy, trade, etc. See May RCSD for stock of sailplanes available. Contact Ben Demeter, 7920 Candleflower Circle, Colorado Springs, CO 80920; Tel.: (719) 531-0350 (days) or (719) 594-0315 (eves.)

• • FOR ONLY \$3 YOU CAN GET • •

YOUR AMA NUMBER in computer-cut 2 mil. vinyl, 2" high.

Includes:

- your choice of 13 colors • forward or backward slant
- four tpestyles • custom lengths •

Each character is pre-pasted on one application strip.

NOT A DECAL

We can cut any text you want.... We ship by first class mail. Call (818) 363-7131 or write for free information package.

VINYLWRITE
CUSTOM LETTERING
16043 Tulsa Street • Granada Hill, CA 91344

*plus P&H and tax where applicable



Viking Models USA
2026 Spring Lake Drive
Martinez, California 94553
(415) 689-0766 (5:00 - 10:00 P.M.)

I wish I had pictures of the finished gliders for each of the fuselages that are available in my catalog. So, I am offering you a 10% DISCOUNT on the 2ND fuselage (any sailplane) you order from me IF you will send me a picture that I can use in my future catalogs and scrapbook.

HOW IT WORKS

Order a fuselage today, send me a picture of the sailplane when it is completed, and receive 10% off the next fuselage you order from me! Or, if you already have one of my fuselages, send me a picture of the completed sailplane and receive the 10% discount on any fuselage you order, now!

Happy Flying, Jerry Slates
P.S: Call or write for the June, 1989 Catalog.

GLIDER RETRACTS

Precision units made in USA from aircraft quality materials. Two 1/4 scale size units to choose from: Std. - up to 10 lbs., H.D. - over 10 lbs. \$50.00 each + \$3.50 S&H. CA res. add 7% tax. Send Sase for information on glass 1/4 scale DG 202 fuselage. 1/3 & 1/5 scale retracts available soon.

Scale Glider Components

7034 FERN PLACE
CARLSBAD, CA 92009
(619) 931-1438