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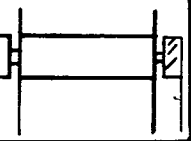
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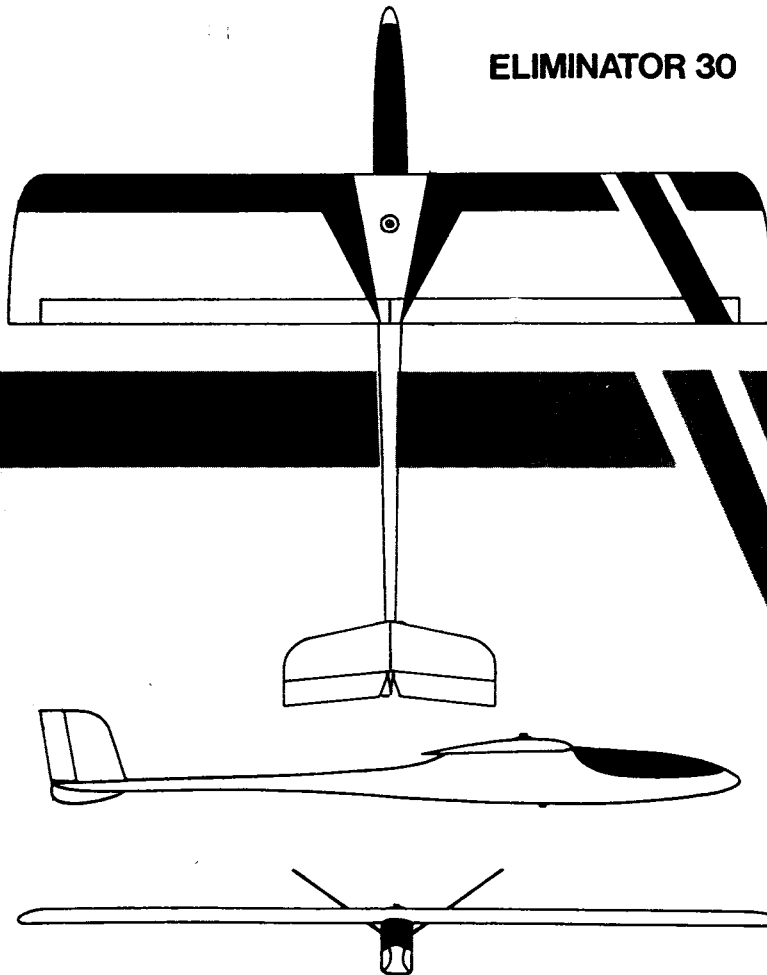
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## ELIMINATOR 30



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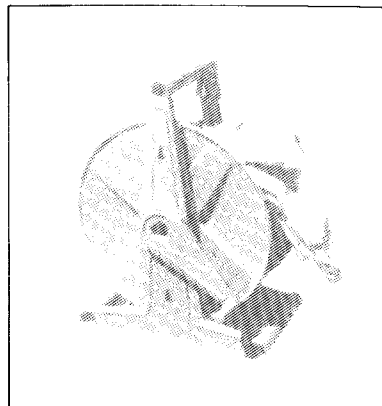
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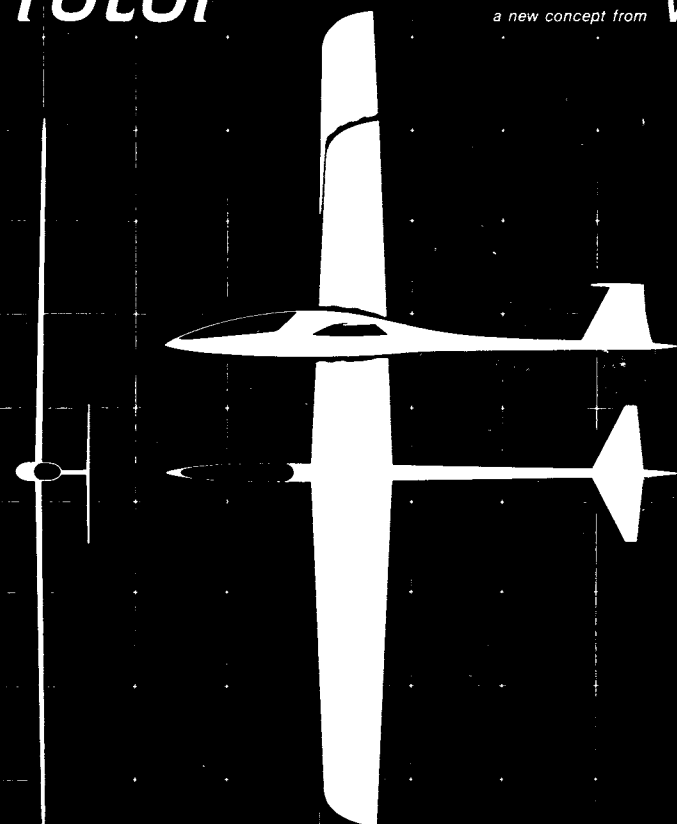
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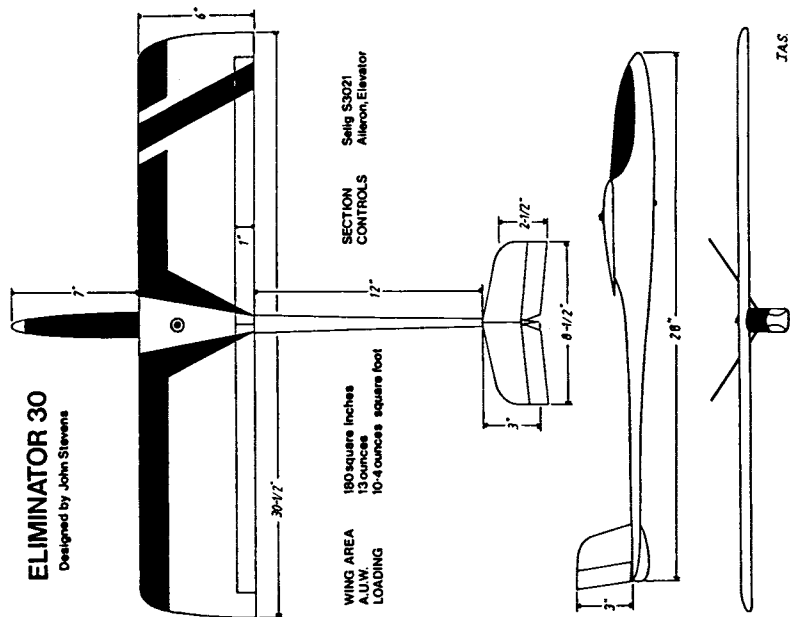
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**ELIMINATOR 30.....John Stevens**

A few weeks ago my friend Tony Beckett from England sent me some information about a new hand-launched sailplane that he has been flying. It is called the Eliminator 30, and looks like a lot of fun, so I decided to bring you Tony's comments as well as those its designer, John Stevens. (JHG)

John Stevens:



I built my Eliminator 30 as a quick 'breather' model between two competition models. I made extensive use of the D.A.V.B.\* principle to get the model finished in the shortest time possible.

The wing T.E. overlaps the fuselage by 1.1/4" so that the aileron horns could go directly into the fuselage thus omitting all the hassle of fitting torque rods. The wings are fully sheeted with 1/16" balsa with webbing tapered from 1/2" at the wing bolt to 1/16" at the tip. covered with glass cloth and epoxy. The ailerons are hinged using Sylglass tape.

Fuselage has 1/32" ply sides 1/8" square stringers and sheeted top and bottom with balsa.

The V tail is from 1/8" sheet again using Sylglass tape to hinge the elevators. Radio is Futaba two channel 27 MHZ. Sanwa 401 mini sevos and Acoms 150 ma nicad.

I originally intended for it to be a hand launched glider but the launch height from one of my best 'all or nothing' throws was rather disappointing so a mini bungee was made up and then the fun really started - the launches on this are real rocket affairs with impressive pings.

After trimming the control throws were increased which makes flying it quite exciting - too twitchy for some people. Rolls and loops are great but with the S 3021 wing section inverted flying is only just possible and it loses height very quickly. It also runs out of steam too fast to do a full bunt.

Of all the models I have built so far this one definitely has the best building time to flying enjoyment ratio yet.

\* Design As You Build.

**Eliminator 30 (Continued).....Tony Beckett**

"To add my comments to John's, the Eliminator 30 he built for me has a modified Eppler 205 airfoil. This comes from Nick Wright, who described it as 'a profile thickness form of an Eppler 205 superimposed on a 1% camber line...gives a slight bias towards C<sub>L</sub>'.

"We are into subtle differences here, and John was working from a photocopy of the original 9" (chord) section. How he reduced it to the 6" chord needed for the Eliminator 30, I don't know.

"Flying mine in a good blow, I have managed outside loops with no trouble, and it will keep going inverted reasonably well. I think that John and I would have to fly the models side by side to really compare the difference in the sections (Eppler 205 Mod., vs. Selig 3021) but it looks as if the modified Eppler 205 section has a slight edge.

"I'm delighted with the flying capabilities, and it is so maneuverable that you can explore the edges of a slope and make use of light lift. It does come down fast if there isn't any lift about, though. On poor local slopes, the best bet is a bungee (hi start) and accept short flights if you don't manage to use lift properly.

"At Burrough Hill in anything above 8 mph, it is fine. (My six-foot aerobatic model needs 12 mph to fly). A session last weekend with a mean breeze of 30-mph-plus, gusting to over 40 mph, had the little 30" Eliminator rushing around the sky with no problems. There is no room to ballast, so it was flying at 10 1/2 oz. per square foot. The whole thing is so clean that you just put the nose down and off it goes. In those kind of conditions, the bigger model is difficult to launch as it gets twisted about in your hand. The 30-inch model is so small you can grip it easily and throw it straight off.

"In the Burrough Hill flying that you remember (I visited Tony in 1985 and we flew at B.H....JHG) the aerobatic model would have flown in the 'strongest' of the light wind we experienced. No chance for aerobatics though. As the wind dropped even further, it would have meant swapping from the aerobatic 'chuckie' to a conventional FLINGER or KASTAWAY which fly at 6 oz. per square foot."

**Editor's note:**

It's pretty obvious that the Eliminator 30 isn't a thermal sailplane, but it ought to work really well on the slope -- even in light lift -- as Tony mentioned. The use of a hi start or "bungee" as he calls it is a bit surprising for slope work, but I guess it will get some initial height so that you have altitude to penetrate out into better lift. I'll bet the same design with a bit longer wing, say 48" or 60", would give you something that could be flown in almost any conditions, merely by changing wings. As far as I know, there are no plans available. However, if you are interested, you might get in touch with John Stevens at 18 Ipswich Grove, Norwich, ENGLAND. Sorry, but I don't have the Postal Code for Norwich. RCSD wishes to thank the July 1988 issue of EASTERN RADIO CONTROL SOARERS club newsletter for the information presented herein.

RCSD'S MAILBAG

FEEDBACK: In Ben Trapnell's review of the BIG WING (RCSD, Vol. 5, No. 8 -- August 1988) he mentioned the good features of the model and thought that it represented a good value at the under-fifty-dollar price. Now, we have a letter from Bob Ratliff of Richardson, Texas, who says:

"I wrote you a negative letter against scale. Now, I would like to write a positive letter commending you on the flying wing article and the promise of more information on flying wings. I am interested in delta and swept-forward wings. I would also like to obtain an IBM computer wing design program."

"I see Ben Trapnell is biased on the Big Wing review. He made all the positive statements, but left out its lack of forward stability (sic). If you trim for more speed, the wing speeds up but then noses up and slows down. Also missing is the note that the wing is not strong enough for a good high start launch. Regards (signed) Bob Ratliff"

Editor's reply.

Good comments. Thanks...I'll pass them along in a subsequent issue under "Feedback." Also, you'll be happy to know that there is a flying wing design series by Bill and Bunny (B<sub>2</sub>) Kuhlmann coming along, beginning with the September 1988 issue of RCSD. This will extend over a period of about five or six months, with one article per issue.

I've been a "wing nut" for many years, and the thing that started me was flying (full scale) in my Schweizer 1-20 on the Harris Hill ridge in company with a French Fauvel AV-36 flown by a Canadian pilot from Montreal. It was an amazing thing to fly with, and to see from almost any angle. That got me all excited about tyailless sailplanes, and I'm still excited!

Bob, the term "forward stability" has no meaning for me. If you mean that the flying wing section has a trailing edge reflex, and that when you put "down" trim in it, the wing noses up, then that's a characteristic of all flying wings. When you feed in "down" the elevator goes down and changes the airfoil from a reflexed airfoil to one that is neutral or even has a slight trailing edge droop. Since the wing is balanced to fly with the reflex in it, then a change from the reflexed section to another section will cause a pitch-up or pitch down, depending on the direction of movement.

Some flying wings do not depend on trailing edge reflex for stability, but instead use sweepback and a lot of washout in the tips -- actually a progressive washout from (way inboard toward) the center (of the wing) toward the tip. I do not think that elevator application causes the same problem with this kind of wing that it does with a reflexed wing, but it does have problems of a different kind associated with its design.

One possibility to consider is a sliding weight operated by a servo. Now, you can get pitch control without changing the wing's reflexed elevator position, but it might be dangerous if you go too far. I'd say it's worth a try, however, and I think you'll find some interesting design factors as you go along.

I agree that Ben didn't stress the problems with a winch launch, but on page 11 he did say: "Using only the recommended 3-pound maximum tension on the upstart..."; and also, elsewhere: "...my friend brought along his upstart for motivation." Clearly, this implies -- but doesn't state specifically -- that a light hi start or upstart with 3 pounds maximum pull is the recommended procedure. I'll grant you, we should probably have mentioned "no winch is to be used, unless the wing is strengthened to suit." (JHG)

One more comment about trimming any sailplane: if the balance point (C.G.) is such that it is too far forward (excess nose weight) the reaction of the sailplane to nose-down trim will be to speed up at first and then nose up and slow down. I wonder if perhaps your BIG WING has a slightly too-heavy nose weight and a forward (of desirable) C.G.? Just a thought. (JHG)

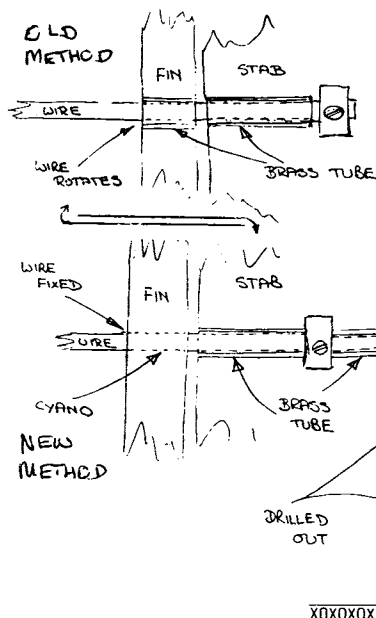
MORE MAILBAG.....Soputh Africa

Our friend and sometime correspondent John Lightfoot, 66 Second Ave., Rondebosch East 7700, South Africa, has sent us some info that will be helpful to those of us who fly sailplanes having all-moving stabilizers attached high on the fin.

...continued next page...

Mailbag (continued).....John Lightfoot

"In your latest note you commented on a series of mishaps including one which involved flutter on the stab of your Sagitta. You might be interested in the modification I made to mine from the word go. I hate whole stabs pivoting on a wire through a fairly narrow fin. On some models I have built out a fillet on the fin so that the tube is at least an inch long, but



I used the basic idea of the Sagitta mounting and changed it so that instead of the system as sketched here, with the wheel collet fixed firmly to the wire and the whole lot turning in the fin tube, the mounting wire was glued into the fin so as to give a rigid mount, and the collets were drilled out to a depth of a millimeter or so to the diameter of the brass tube in the stab. The collets were thus effectively 'captive' on the tube but could turn enough to allow free movement of the stab about the fixed wire. I have never had the slightest sign of flutter, even in 24-second speed runs! That's the best time I have aspired to in F3B before the terrible attrition rate decided me to return to more leisurely flying. Regards (signed) John."

Comments:

The only possible disadvantage I see in this system is that the wire through the fin is fixed and projects out on either side of the fin -- when the stab halves are removed for transporting the fuselage or storing it in a box. (JHG)

XOXOXOXOXOXOXOXOXOXOXOX

GREAT SOARING OVER ANDERSON'S SOD.....Lee Murray

1300 Bay Ridge Road, Appleton, WI 54915  
The afternoon of Saturday, June 4th, may have been the all-time best thermal soaring conditions I have ever seen. The winds were about five to ten mph, the sky was clear except for the columns of haze created by bubbles of warm air lifting off the ground (Great Scott! The man "sees" thermals-JHG.). I could see cottonwood seeds high in the air, and there wasn't a tree within a quarter mile. I had only three flights that day, but three were plenty, resulting in 73 minutes of air time. The third flight really shouldn't be counted, as it was done as a 2-minute precision landing drill.

I met Mike Poeschl and two visitors from Denver, one of whom was a sailplaner. They were going to be in town for a few months working on a new paper machine in Kimberly, Wisconsin, not far from Appleton. After a little difficulty in finding a loose connection with the winch, the first launch of my CUMIC was into lift. I passed the transmitter back and forth, sharing the excellent lift with one of my visitors. This was a day when spoilers were a must, and you could lie on your back and fly -- looking up into the sky for long periods of time. It was lucky that there were three of us watching the CUMIC because at one time it disappeared for a few seconds. Each thermal seemed to last about ten minutes, and then it was no trouble to fly upwind and catch the next one.

Three different times I joined a red-tailed hawk whose internal thermal sniffer was doing a great job in pointing out the lift areas. To give you an idea of how good the conditions were, Tom Lund's Telemaster 40 thermalled for over 9 minutes with the engine off. Although dry conditions may be causing some problems for the farmers, they are sure making Anderson's Sod Farm a great thermalling site so far this year.

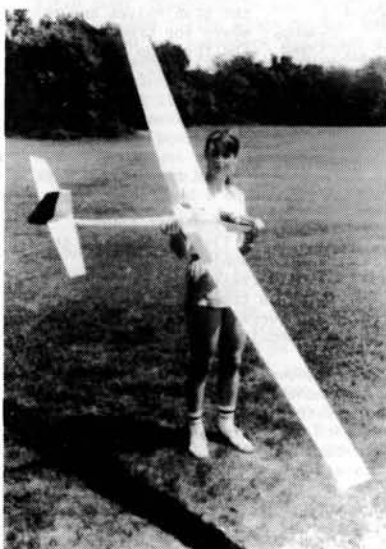
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**BRILLIANT "E" - A GERMAN ELECTRIC.....** Stan Koch

Stan Koch, 180 Carnavon Parkway, Nashville, TN 37205 writes about his new German electric-powered sailplane, the "Brilliant - E" by Ralf Markwort.

" A couple of years ago a photo appeared in your column in Model Airplane News, showing what looked to me like an outstanding electric soaring machine. It was called the Brilliant "E", manufactured in Germany and built by Ralf Markwort, also of Germany. His experience with this machine, as described in your column, was enough to stimulate my interest. Obtaining the kit will require another article or so! Suffice it to say that finally, with Ralf's help, I obtained one. The materials were not bad: fuselage of glass, wings built up with oh-so-many ribs. The parts fit exceptionally well, and the only item I didn't like was the solid sheet stabilator. This has since been changed (to a built-up stabilator).

All-up weight of the Brilliant E is 4 pounds 6 ounces. She has a wingspan of 102", a root chord of 9" and a tip chord of 6" for an area of 765 square inches. I power mine with an ASTRO Cobalt .05 direct drive, swinging a 7 x 5 REV UP propeller. Oh, by the way, the Brilliant "E" is a pusher. I use seven 1200 mAH cells (Sanyo) with an ASTRO on-off switch. The ship is controlled with rudder, stabilator and airbrakes. For a heavy ship, it climbs rather well (about 500 feet on a one-minute motor run, and I get three good one-minute runs. The BRILLIANT soars very well and is a fun ship to fly. If anyone is interested, I understand that TEL-KO TRADING COMPANY OF TEXAS, INC., 4801 Woodway Drive, Suite 300 E., Houston, TX 77056, has imported some. ALSO...I purchased three kits and have one left. If interested, my cost was \$138.56 (including shipping and duty) and it is for sale, first come, first served.

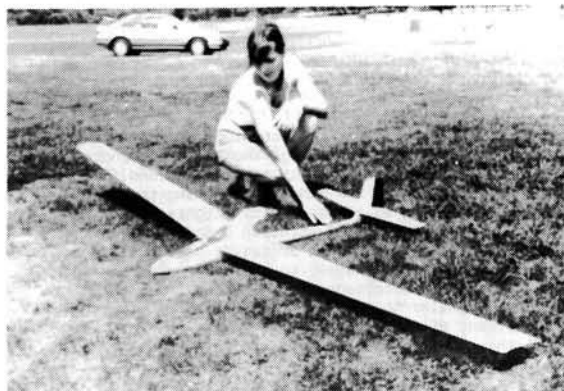


Stan Koch's BRILLIANT E posed with lovely friend.

Note batteries under canopy in the nose, and observe that BRILLIANT E is a pusher design.

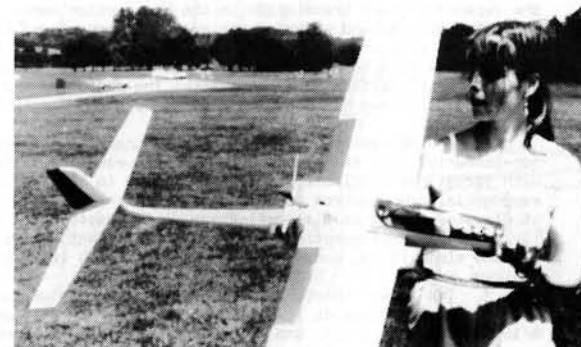
Pusher electric models can be a problem because of cooling airflow, but in this case, the pod arrangement allows excellent air flow over the electric motor.

One big advantage of electric-powered sailplanes is their ability to be launched from smaller fields because no winch or hi start is needed.



BRILLIANT E has nice, slim tail boom and conventional empennage. Motor, radio gear and batteries are well-spaced ahead of and behind C.G. for good balance.

Brilliant E with 12:1 aspect ratio on 102" span is nicely proportioned with faired-in power pod that does not detract from appearance or soaring performance.



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**ECLIPSE - A SAILPLANE FOR ALL SEASONS.....John Berry\***

Further to your request for more information about my ECLIPSE and Futaba PCM 1024A radio, I have taken up your challenge and enclose a photo and three-view of the model. I built mine as a T-tail as it looks and flies more scale-like in my opinion. You also get the benefit of having the stab well clear of the ground when outlanding on cross-country flights.

Ralph Learmont of Southern Sailplanes (Australian Company) makes the fuselage and cuts the foam cores for the wing. His prototype uses a sliding servo block of three servos, plus complex linkages, to get the needed mixing. Five functions are used to get maximum performance from the design: flap and elevator are coupled in a manner similar to that of the WINDSONG to prevent ballooning or flaring on deployment of the flaps when going for the spot. No spoilers are used. Instead, the ailerons are reflexed as spoilerons, and rudder is coupled to the ailerons. The linkages were too messy for my taste, and once I got my hands on the new Futaba PCM 1024A computer radio, I knew I had a solution to the mixing/linkage problem.

Braided cable is used throughout except for the elevator, where a push-rod is used. This requires metal quick links and some patience when soldering to get the proper alignment. The flap linkage has a shock absorber system to protect the servo gears in case of contact with the ground on landing. It works very well, as I have had no servo gear troubles.

The real challenge with the Futaba installation was to make sense of the Japanese-English translation in the instruction manual. In the end, I gave up in frustration and scrapped the manual and proceeded to program the mixing based on my limited computer skills (mainly Lotus 123). After many hours of mistakes, I was able to program my radio to mix aileron/spoileron/rudder as one set, and elevator/flap as another set. The radio can mix four sets of functions as required. Given nine channels, it means that almost any configuration is possible.

Another great feature is that you can proportionally mix functions non-linearly. For example, you can program elevator to be 25% of flap movement with variations available in 1% steps from 0 to 100%. By varying servo travel exponential compensation can be programmed, increasing the proportional amount of elevator travel as flap deflection is increased. You can also store settings for up to six configurations such as for different weather conditions or for thermal and slope flying conditions. The mind starts to boggle at the available choices.

The "spec" sheets for ECLIPSE are self explanatory, and the wing cores on mine are one-piece at 1.7 meters each (5'7"). The cores were covered with 1/16" lightweight balsa, and they cores have 1/2" aluminum tubes extending out to about 55% of the half span from the root rib toward the tip. Parts of the wings, stab and rudder are reinforced by 1/64" plywood.

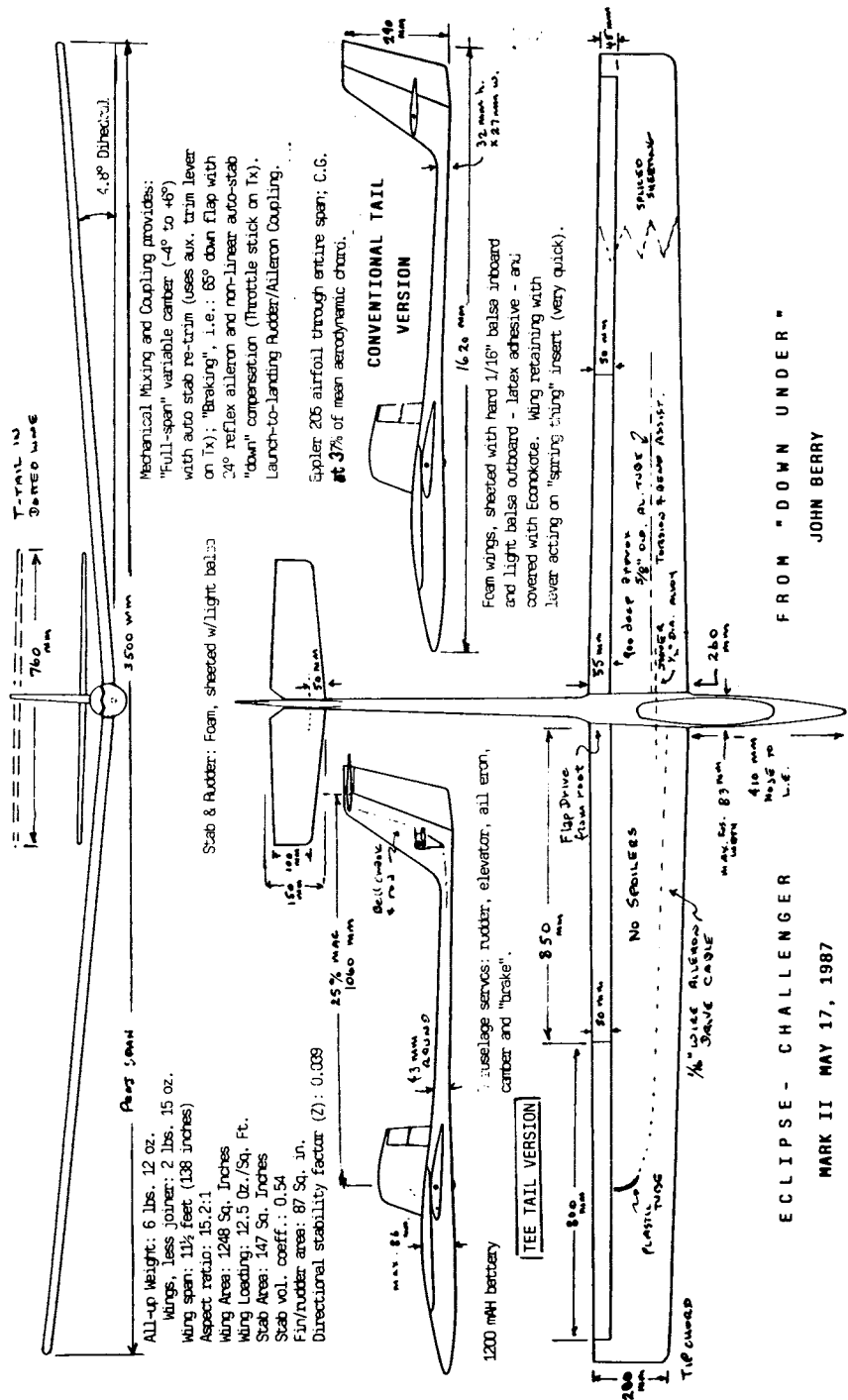
To say that the model is a good machine is probably an understatement. Ralph Learmont won the Australian LSF Annual Tournament at Jerilderie in 1987 with the prototype model. In 1988 the LSF meeting consisted of mainly still-air conditions, and the "floaters" were able to hold their own with ECLIPSE... BUT, if there is a wind of any kind over 10 knots, the ECLIPSE can penetrate at speed, yet land at a snail's pace. You have excellent control with the five mixed functions.

Like all designs and radios, ECLIPSE and the Futaba PCM 1024A require lots of practice before competing. I managed to hit myself on the leg several times at Jerilderie this year when going for the spot, due to the slippery conditions and my lack of practice with the model. I finished ECLIPSE only 2 days before the competition!

The radio installation comprises one servo for each aileron, with a single servo each for flap, elevator and rudder.

I plan to use my ECLIPSE for LSF Level V tasks in the near future.

\* 8 Roundhay Court, Berwick, Victoria, Australia 3802



ECLIPSE - CHALLENGER

MARK II MAY 17, 1987

FROM "DOWN UNDER"

JOHN BERRY

RAZOR'S EDGE.....Asher Carmichael

### CANOPIES:

There are many generic fiberglass fuselages available to sailplane modelers today, and Bob Sealy's Quality Fiberglass and Viking Models USA are just two of the better known suppliers. The quality of the product from these molders is exceptional -- which adds to the appeal of "ready-made" fuselages.

Occasionally, generic fiberglass fuselages are supplied without canopies, and it's up to the individual modeler to construct one. I have tried solid balsa, foam, and built-up canopies...and they all work well. However, there are a few tricky areas that require persistence when it comes to fitting the blocks to the recessed areas in the fuselage at the cockpit location. The following descriptions and illustrations relay the techniques I use to achieve tight-fitting canopies.

**Fig. 1:** There are two basic types of canopies: continuous form and articulated form, which refers to the base construction. A continuous form base is one piece of 1/64" ply which conforms to the shallow curvature of the canopy recess. The articulated base requires joints to match the hard angles found in some designs. The articulated base is typically made from 1/16" ply or 1/8" lite-ply material, depending on the size. The construction of these two types is the same once the base has been fitted, and/or joined to match the fuselage recess.

**Fig. 2** shows the layup process for a continuous base canopy. An articulated base canopy would be the same except for the joints between the floor and the fore-and-aft formers. Construction of the base is still a measure-and-cut process whereby you cut or sand the angle in the formers where they meet the floor of the base. The formers may be "zapped" to the floor as you proceed with base lay-up.

Use square pieces for the base construction so that a true outline of the recess area in the fuselage is presented along the outside edge. The base should overhang each side about 1/2". Use spray contact adhesive to secure the base, wax paper and glass cloth to the recess area. Spraly **one mating surface only** so that you can separate the canopy from the fuselage. The wax paper is to help insure release. The glass cloth is underneath the base to compensate for the thickness of the fiberglass and paint which will be applied to the canopy after final shaping and sanding. Glass thickness compensation on the sides will be achieved later in the process. Be sure you use the same weight cloth you intend to use for glassing the canopy.

**Figs. 3 & 4:** Line up the foam (or balsa) with the top edge of the floor and mark the former lines on the foam. Be sure you have enough thickness to mark out the top profile. Cut the foam outside the lines (about 1/32" full) and line the base with a sheet of 120 - 150 grit sandpaper. On an articulated base, you will have to crease the sandpaper at the joints. A very light coat of spray adhesive will secure the sandpaper to the base. Fit the foam to the base by sanding the bottom of the foam -- sliding it back and forth over the sandpaper. It won't take long to get the feel of the sliding movement, and the foam will settle quickly into the base. Remove the sandpaper.

**Fig. 5:** Use a saw, knife or sandpaper to trim the base to match the fuselage plan. Lay the foam block in the base approximately at the centerline and mark the top profile curvature along the foam. Use a piece of spruce or balsa as a "batten" to guide your marker and hold the batten at each end with rubber bands. Saw the foam top profile to rough shape. Also, mark the base plan shape on the foam where it meets the base, and rough-saw the plan outline.

Glue the foam to the base using a slurry of epoxy and micro-balloons (about a 50-50 mix by volume). This will insure a sandable glue line between the foam and the plywood. **Don't** use white or aliphatic glues as they shrink when they dry, and this might deform the base fit.

**Fig. 6:** When dry, sand the top profile contour for a smooth line between the fore and aft formers. Mark a centerline along the longitudinal axis of the foam. This is your reference line for sanding. By avoiding this line when you shape the canopy, you will preserve the profile shape.

Sand the canopy to match the fuselage, using 100 - 120 grit paper for the rough sanding/shaping...it won't take long to sand it to a perfect shape. A final sanding with 150 - 180 grit paper will smooth the foam for fibreglassing.

### CANOPIES BY CARMICHAEL (Continued)...

Remove the canopy from the fuselage by prying it off the wax paper. You may have to wiggle it, or insert a thin knife blade here and there to pry it off. Be careful not to damage the foam.

Compensate for the glass thickness along the sides of the canopy by placing the foam canopy back in the recess so that it overhangs slightly the fuselage side. Four-ounce cloth is only .008" thick, so it doesn't take much. **Do one side at a time** and sand the sides to match the fuselage. Contour the sanding up the side of the canopy blend it into the previously-sanded top.

**Fig. 7:** Fiberglass the canopy using cloth and epoxy resin. Attach a length of wood to the bottom of the base and support the canopy on your work surface. A vise will hold it securely. Lay out the cloth on a piece of glass and saturate it with resin. Hobby-Poxy II or Safe-T-Poxy works great for this. Squeegee off the excess resin and apply the cloth to the canopy. Allow it to cure. Trim the cloth around the base and apply another coat of resin. You may want to glass the bottom of the base with light cloth and Zap after you remove the support from the base.

Finish the canopy using your favorite paint scheme and install an appropriate latch to complete your canopy for that new plane. We don't have to mention that this works well for adding a new canopy to an old plane, too, but we might just as well say so anyway!

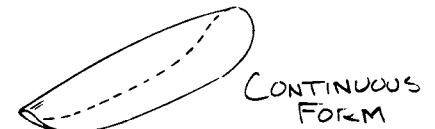
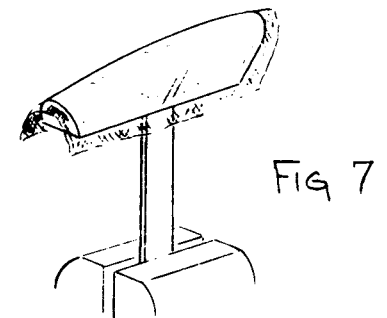
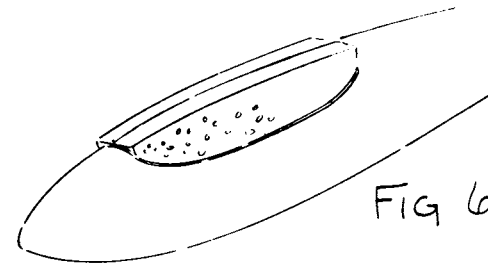
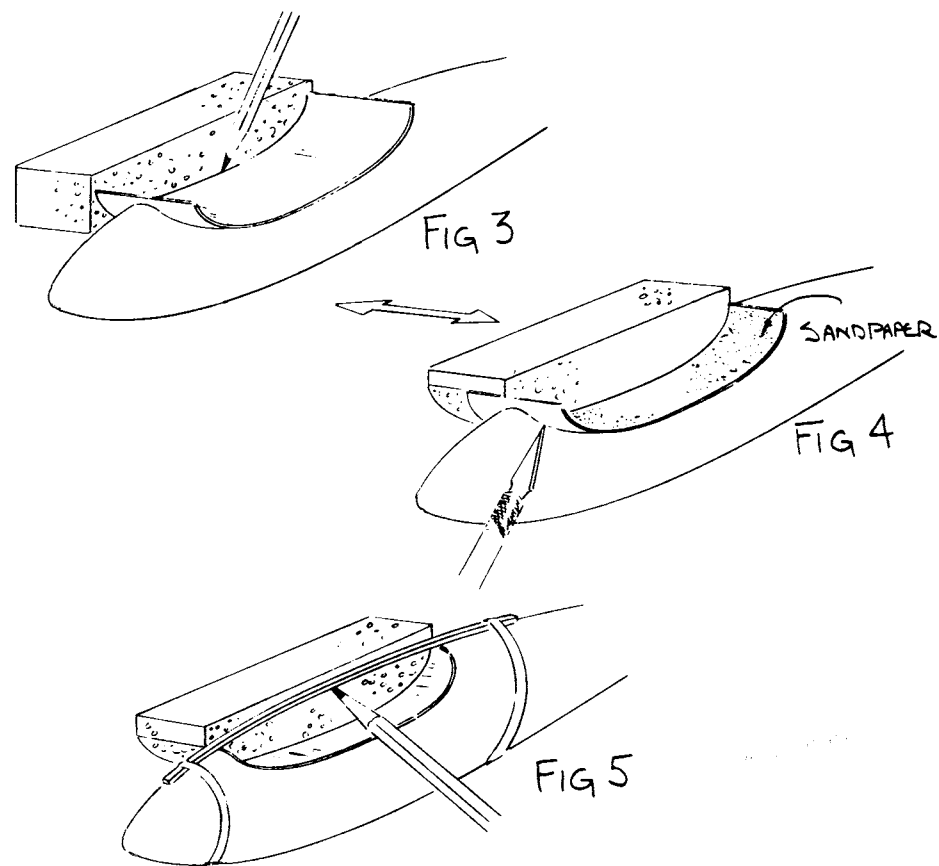
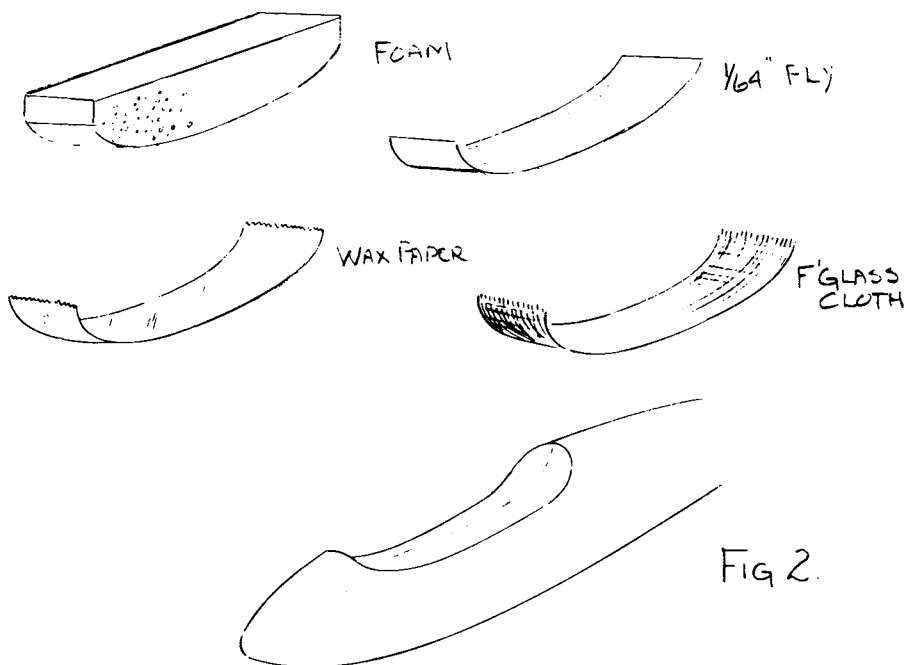
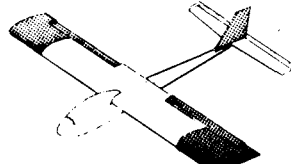

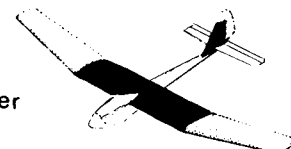


FIG 1





	<p><b>INDEXONE</b> SLOPE SHIP 48" wing span Aileron / elev. Fully aerobic \$29.95 + \$4 S &amp; H</p>
	<p>FIBER FLIGHT 3305 N. Carriage Ln. Chandler, Az. 85224</p>
	<p><b>INDEXEM</b> SAILPLANE 78" wing span Rudder / elev. Thermal floater / trainer \$34.95 + \$4 S &amp; H</p>
<p>COMPLETE INSTRUCTIONS 602-838-8921</p>	<p>ALL HDWE. &amp; COVERING INCL. 602-821-0517</p>

ELECTRONIC ALTIMETER (AGAIN).....Bob Cheney

There are several possible sources, the easiest being a retired Radiosonde which can be easily encoded or decoded -- or used like a recording barograph by smoking a piece of foil and taping it on the existing encoder board. The electric variety is a bit fussy with regard to temperature and voltage, but once known these factors could be compensated; i.e., nulled out. My pet idea is to run the transducer into an op amp for a proportional voltage output, encode the output voltage with an A to D chip, transmit the digital information as pulses and recover the pulses on the ground through a cheap pocket FM radio and decode the pulses with a D to A chip driving a digital voltmeter module with its 3<sup>1/2</sup>-digit display. These DVM chips are available for \$3 to \$8 and are used in a lot of inexpensive meters by suppliers such as Ramsey and Fluke. One could also use a servo-follower potentiometer of good quality in conjunction with the aneroid from a Radiosonde and accomplish the same thing even cheaper and easier. Another source of good aneroids is from the temperature control element in a chicken incubator. They use a simple single-or double-cell aneroid that expands and contracts very readily with temperature or pressure...and they're available over the counter at Sears Catalog Order Department! One might have to use a little piece of bi-metallic strip from a dead thermostat between the bellows and the potentiometer to compensate for temperature change with altitude, but that would be a "piece of cake." Hang glider pilots use a wrist instrument that is a combination altimeter and variometer in one little box. Push a button and the display shows altitude; push it again and it displays rate of climb...but, wow, are they ever expensive!

\*\*\*\*\*



**ORBITER - A HAND LAUNCHED SAILPLANE FROM OREGON .... Eric Jackson\***

\*Eric Jackson, 4916 S.W. 56th St. #108, Portland, OR 97221

Enclosed are pix of my 2nd ORBITER incorporating a couple of changes the original design. Nothing major...just a couple of "tweaks" to stab area and aileron differential to improve climb, transition and high-speed (launch) handling. **Much better.** This is final version of the non-flapped design.

General consensus is that there's nothing on the field that can touch it -- from the gas bags to the new aileron-equipped birds that are now showing up. If I do say so myself, it's quite a hummer! Hey, got lucky, huh? So far this year I entered 7 local contests with it and won 'em all by various margins.

I mentioned that this is a non-flapped version. I have a new one with flaps that's all designed and half built. Same design, but just added flaps -- and even figured out a way to reflex ailerons ala WINDSONG. Should come out at 14 - 15 ounces total weight...not bad. I've flown the non-flapped ORBITER at this weight and it doesn't seem to affect the light-air performance appreciably. However, the full-span reflex should help the launch height a bit and really improve the top end performance. I'm really quite pleased with the 'plane and it always does what I ask it to do...and always seems to get out of trouble by itself.

Can you believe it? I've had offers of \$100 for my OLD Orbiter! The pix are of Orbiter #2 at a recent contest. If you'll look closely at the root of the right wing you'll see that it's a bit "dinged". Missed a high-speed catch and flew it into my hand! Life's rough when the working clock is ticking!

Someday (yeah, sure...) I might draw up some plans and do an article, but right now it's so good I'm in a "don't want to share it" mood. Besides, if I really go into all the why's and wherefores about why I did this and that, and why I believe they work, a lot of 'experts' would tell me I was insane (which is close to the truth!). Enough about my paranoid apprehensions. I'll let you know what I decide at the end of our ten-contest HL season. Make you a deal: If I win all ten contests (not likely) I'll do the article for you.

I still like "the Digest" but it needs more scale and cross-country and more hand-launch stuff. (Okay, Mr. Bamboo, YOU can solve that; where's the article, huh? JHG). Personally I don't give a hoot for the F3B money game, but I do like your idea of a one-design contest. That would put the emphasis on the pilot and not the pocketbook. Keep up the good work. (Signed) your friend, Eric.



**Kit Review by Doug Klassen**

Kit: "Index One" by Fiber Flight  
Mfg. address: 3305 N. Carriage Lane, Chandler, Az. 85224  
Telephone: 602/838-0517  
Design: 48" span slope soarer  
Controls: ailerons and elevator  
Wing Area: 408 sq. in.  
Fuselage length: 34.5 in.  
Flying Weight: 33.8 oz.  
Airfoil: Fiber Flight design, semi-symmetrical, 8.5 in. chord  
12% thick  
Retail Price: \$30.00 direct only

Imagine American Express Travelers Checks spokesman Karl Malden speaking: "You've just crashed your last glider, your check book is empty, your wife won't share the grocery money, and you want to go slope soaring. What will you do? What WILL you do?" Well friends, if you're T.J. Webb and Mike Dobbs you look around the workshop and see what's left that can be turned into a flying machine. In their case a careful scouring of the corners produced some blue foam, tag board, a few scraps of balsa and a large sheet of corrugated cardboard. A short time and a surprising amount of creativity later the first Index One was born. First flights of the decidedly low-tech design revealed not only a very nice flying glider but one possessing amazing durability when impacting the rocks and cactus of the typical central Arizona slope site. Hoping to spur the slope soaring activity in Arizona Webb and Dobbs formed Fiber Flight and began producing Index One kits. The subject of our kit review is the latest in a design that is updated nearly every kit.

The hardest part of building the Index One is not taking it too seriously. Mind you the glider deserves serious consideration as a slope soarer but if you're sitting there with cabinets full of carbon fiber and Kevlar or \$5,000 worth of precision wood working equipment you're going to have to get your mind right to enjoy this particular model. Simplicity is the key to the Index One and you're going to have to fight down the urge to complicate what is a simple and workable design.

**Wing construction:**

The actual assembly of the wing is a simplified version of the typical foam core construction process, i.e. stick some spars in the notches, wrap some sort of covering around the wing and then cut out the ailerons. The Index One differs from the norm in that the single light-ply spar is glued vertically into a notch in the bottom of the wing rather than the top of the wing. It seems to provide an adequate amount of stiffness without making a lump in the top of the airfoil. The written instructions tell you to use white glue to bond the spar into the notch and I did but the notch is a bit oversized for the spar so epoxy might have been a better choice. The wing covering is simply colored tag board bought in the art department of the local K-Mart. It wraps around the wing beautifully and gives a decently hard surface. The instructions specify using rubber cement to attach the covering but I opted for my favorite wing skin glue "Sorghum" by Southern R/C Supply. The instructions also talk about

"creasing" the leading edge portion of the covering. I believe this is a method left over from the first Indexes that were covered with a stiffer index card paper (now you know where the name comes from). I chose to sand off the foam flash from the hot-wire cutting and wrap the covering smoothly around the leading edge. Next the ailerons were cut out (full span) and the edges of the ailerons and the cut-out areas were wrapped with clear tape. Remember on the ailerons to insert a short piece of brass tubing or nyrod into the foam to act as a reinforcement for the aileron rods. It's not mentioned in the plans and the holes will elongate very quickly if you don't reinforce them. I haven't mentioned every step in building the wings first because space in RCSD doesn't permit me getting any more wordy than I am and second because a lot of the steps aren't there in this airplane. That's right friends, no leading edges, no aileron leading edges or sub-spars in the cut-outs, no reinforcement of the center section, nothing, zip, not there, simple. Resist the urge to add them. They aren't needed on this glider and if you add them you've missed the point of the Index One.

#### Fuselage construction:

Here's where we get right down to the heart of the Index One. You want easy construction? This baby's easy! You want durability? This baby's durable! You want sleek aerodynamic design? This baby's durable! The fuse is simply folded out of one big piece of pre-marked corrugated cardboard. Not hi-tech Kevlar cardboard reinforced with carbon fiber; just ordinary cardboard like you find behind the grocery store. To be completely fair there are some reinforcements in the cardboard in the form of left over sheeting from the wings and three small semi-accurate plywood bulkheads. But basically it's just cardboard and basically it's just ugly. Follow the instructions (which are a bit vague here and there) and put some faith in function rather than form. The nose block is a bit unusual in that it is the same blue foam that the wing cores are cut from. In fact, save the wing saddles and you can make more nose blocks. Once again you have to get your mind right and resist the temptation to replace the nose block with balsa or swath it in 6 oz fiberglass cloth. The foam block acts as a replaceable shock absorber for the fuselage. Replace it and you will give up a certain amount of over all durability.

#### Tailfeathers and misc.:

The vertical and horizontal stabilizers are straight forward except that they are covered with more paper. Don't use CA type glues here as they will soak through the paper. Hardware for hooking of the control surfaces is included in the kit. The nylon connectors for the ailerons are a bit brittle so I'd recommend replacing them with your favorite type is before the first crash. The "canopy" is one more piece of blue foam that has been hot-wired to the general shape required. I thought it was a bit too thick so I exercised some artistic discretion and took about a half and inch off the top. I thought it might make the glider look a bit racier. It didn't.

#### Flying:

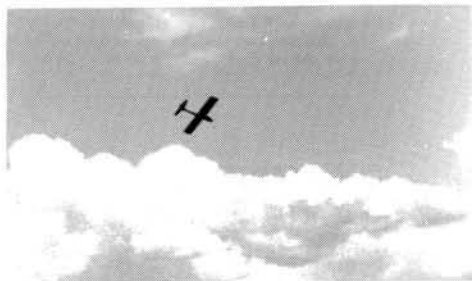
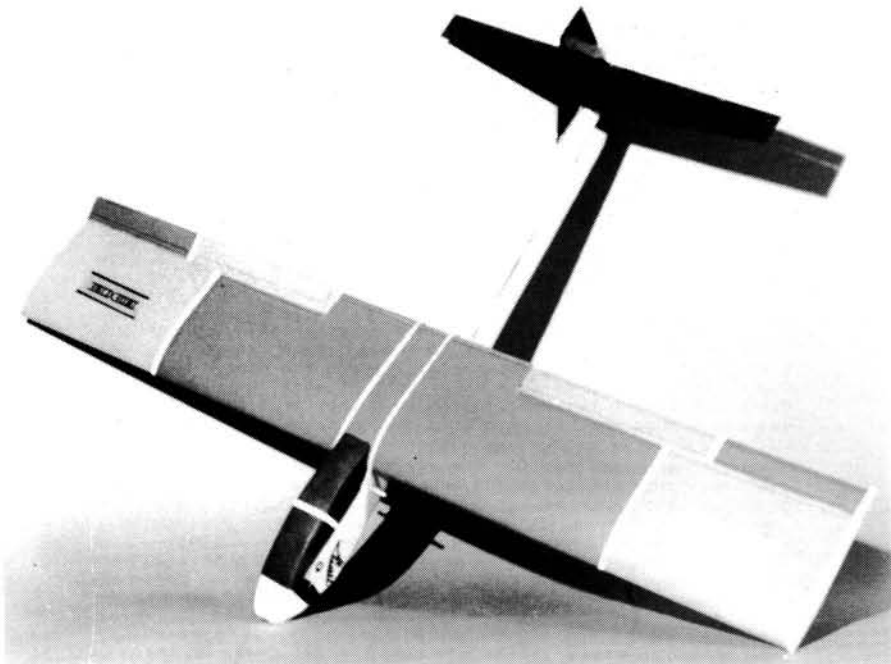
I got around to building the Index about the 1st of June and then set about test flying it. In the finest Arizona fashion I only had to wait until August 14th to get some half-way decent wind on a weekend. I took T.J. Webb with me and we bounced and bumped our way nine dirt road miles to the top of Four Peaks. It was only about 100 degrees at the top which was a lot better than the 113 degrees down in Phoenix. That made it a lot nicer since we only had to sit there for two hours until a summer thunderstorm blew in bringing some decent wind with it. I guess we should have had Rick Palmer drive down from Springerville to fly with us. Then we would have been guaranteed plenty of hot wind all day.

#### Index One (Review Continued)

Anyway, as soon as the lift looked near flyable I tossed the Index off the hill fully expecting to have to do a 180 degree turn and land. The Index not flew out nicely but easily climbed 50 to 75 feet above the ridge. I was quite impressed with the light air performance. The this particular Index was the first one with full span ailerons and the roll rate was much nicer than an earlier Index I had flown that had smaller moving surfaces. The roll rate is pleasant and with a bit more throw and a bit more differential I believe it compares very favorably with my trusty "Cheetah". The pitch control is a bit on the mushy side, something I had noticed on the earlier Index and I believe this mushiness is attributable to the somewhat high aspect ratio horizontal stabilizer. As soon as I munch this present stab I'm going to put a lower a/r piece on it keeping the same area. The durability of the Index lived up to expectation. One landing wound up in some really nasty cactus and later in the day we stopped at a promising looking site along the highway where the plane wound up in some other sort of stiff desert bush. Given the choice between landing in bushes or large rocks I'd say the bushes are better choice though fetching the plane out of the large cactus was a thorny problem. The sum total damage of the landings for the day consisted of pulling the elevator hinge (scotch tape) loose. Fortunately I had a roll of spare hinge with me.

If you're new at slope soaring the Index One is a great choice for learning the ways of the wind. It's sufficiently ugly and easy enough to build that you won't feel so bad when you work it in. Beyond that you can do some really grotesque field repairs and it won't matter. If you're Kevin Kevlar, Ace Flyer with a Phd in aeronautical mumbo-jumbo maybe it's time to lighten up a little and learn to get crazy on the slope. This is a great glider for learning those low inverted passes that you've been afraid to try with your Dassel replica. Looking at the Index One kit it's hard to appreciate it and even the finished glider isn't likely to impress too many folks. But flying it day in and day out will prove the Index a winner. And name me one other glider that allows you to get an unlimited supply of replacement fuselages behind your neighborhood grocery store?





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**UNUSUAL SAILPLANE TAKES TO THE SKY.....Lee Murray**

Walter Panknin, formerly of Germany and now living in the USA at 9 Chelsea Place, Great Neck, NY 11021, has created a somewhat different and unusual soaring machine using "left-over" parts. This sailplane is best described as a "dragonfly 2-meter" with pod-and-boom construction. The toilet bowl float provides adequate room for the radio gear while providing impact resistance and ample room for cushioning. The micro-turbulators (bottle brush) following the spherical head prevent flow separation with associated high drag, as does the studded model car tire which also provides crash survivability. The one-liter 7-UP body provides aerodynamic transitioning to the tail boom which bears some resemblance to a fishing rod. The wings and stabilizers as you will note have elliptical shapes at both the root and the tip sections (the more, the better). It is no wonder that this model has already won honors for its landing abilities (best spot landing in a contest) and I can attest to its soaring potential since I recorded flight times approaching four minutes on a windy Wisconsin day.

Walter had this to say: "Last week I spent a wonderful weekend with my old friend Lee Murray. I have been writing to Lee for about 4 years, but only now after I moved from German to the USA did I have an occasion to meet him personally. Recently, I built a very unusual 2-meter glider in the shape of a dragon-fly. The head is made out of a toilet float, the body is made out of a plastic bottle and a fishing rod. If you are interested, I might find the time to write a few words about this fun-flyer. Yours sincerely (signed) Walter Panknin."

Ye Ed has this to say: Yes, I am sure that the weekend was wonderful, possibly because of the liquid refreshment consumed and with the help of the famous Lee Murray (LJM Enterprises) aircraft design program for Apple computers. Although Walter is better known in Germany for his fabulous Rainbow flying wing design, he shall become immortal in the USA for this magnificent contribution to low-speed aerodynamics. Lee and Walter were seen by incredulous neighbors on the local flying field when it was so windy that all else (including resident birds) were not flying. The happy and somewhat tipsy duo were seen with an egg timer attempting to record flight times of the "dragon-fly". Occasionally, and between the flights, both participants were observed partaking of refreshments from a thermos flask...or at least a flask of some kind. I do not question that Walter's assessment of the weekend as "wonderful" is not far from the truth! (JHG).

\*\*\*\*\*

PRODUCTS YOU'LL LIKE.....Jim Gray

Hi Performance Sailplanes, 17902 NE 156th St., Woodinville, WA 98072; Telephone (206) 487-1721 is owned and operated by Ron Wagner, a gentleman who believes that a full-time commitment to quality is necessary -- and something that isn't often encountered.

Just the other day, I received several boxes of samples that included such diverse items as blue foam with Kevlar and carbon mat, balsa with glossy mylar finish (HPE 1 epoxy), balsa with hand-sanded Kevlar (HPE 1 epoxy), balsa with HPE 4 surface filler, some syringes filled with HPE 1 epoxy, and a completed wing half showing the laminated quality of a vacuum-bagged foam and composite wing.

These samples were but a few to show the materials and combinations of materials supplied by Hi Performance Sailplanes, and some of the ways in which they can be used. The wing was impressive with a glass-smooth surface and knife-sharp trailing edge.

The HPE 1 epoxy has been specially chosen and formulated to provide the best possible adherence between blue foam and other composite materials. HPE 1 is a high-quality room-temperature cure epoxy with an option for heat curing. By placing the part in the sun or in a hot box to reach surface temperatures of between 150° and 250° F., you can schedule the curing time you want. It will cure at room temperature overnight, and the pot life is about 60-90 minutes at 75°F.

One of the best products, and a brand-new one, is a wing skin material that is different from anything I've yet seen. It is designed to replace balsa wood skins, and to enhance the wing surface quality where glass cloth is used over blue foam. It is called HP Cell, and has a density of 5 lbs per cubic foot. Sheets 24" x 96" are available, and this large size prevents the usual balsa splices that are needed when sheeting wings. The product is .060" thick, ideal for 7½" to 12" root chords. It is engineered to replace 2 mm. Rohacell, and although denser, less volume is required for a wing... resulting in lighter weight. It sands better than balsa -- and I tried it to make sure it is so. It is! You won't need heavy coats of primer, either, because of the uniformity of this material.

Several techniques can be used to provide finished wings, and these are outlined in the product information sheets provided.

Mylar/foam wing preparation technique is particularly suitable when using the HPE 1 epoxy. A thin, stainless steel spreader blade commonly found in auto supply stores is held at 45° to the surface for spreading the epoxy with final spreading done at 80° to the surface for removing excess resin. The system is clear and has very low viscosity which aids in construction of void-free parts. The major advantage of HPE 1 is its outstanding high-temperature property which allows it to be used for 350° autoclave tooling.

Hi Performance Sailplanes will also custom-fabricate wings by the vacuum-bagging process. You must supply the templates and dimensions and other information needed.

Write or call for product information literature, and don't forget to tell them that you heard about their products in RCSD. By the way, Hi Performance Sailplanes can provide small as well as large quantities, and you don't need to make volume purchases like some other suppliers require.

WHAT'S NEW IN THE LITERATURE.....Jim Gray

Here's something you're going to enjoy -- a lot -- especially if you're a slope soaring enthusiast. SLOPE SOARING NEWS. It's a publication whose time has come, it seems, and I'd like to recommend it to you. Charlie Morey, Chuck Korolden and Marcie Berriz are the folks who put it all together each month and send it on its way.

Quoting from the letter I received the other day (along with a copy of the publication): "...deals only with R/C slope soaring, specifically as it's practiced in California...but please don't think we're snubbing other fliers across the U.S. It's just that we're a tiny new publication with a volunteer staff of three, and we don't pretend to represent slope soaring on a national level. We do welcome contributions from readers all across the U.S., and would be delighted to print interesting info from anywhere in the world! We hope wider recognition will come in time, but for now, we're hopelessly-local Californians. "Of course that's not all bad. The innovative, even ingenious gliders our flying buddies bring to the slopes each weekend are newsworthy. Slope Soaring News will bring these new concepts to a forum where we all can share in the knowledge."

It's a good-looking publication with lots of photos and interesting text, all wrapped up in computer-generated graphics and typeface...a good example of desk-top publishing at its best. The "labor of love" aspect is obvious, as is the enthusiasm and sparkle that Charlie, Chuck and Marcie bring to our sport.

You'll find it easy, even breezy, to read in a lucid and friendly West-Coast style. Why not call or write today and reserve a subscription for yourself? Slope Soaring News, 2601 East 19th Street #29, Signal Hill, California 90804; Telephone Charlie at (213) 494-3712 to wish him luck, and please mention RCSD.

\$\$!\$\$!\$\$!\$\$!\$\$!\$\$!\$\$!

AVE et VALE - HAIL AND FAREWELL.....Jim Gray

Most of you know RCSD's Graphics Editor Bob Rondeau, and many of you have written to me praising his clean, concise artwork and clear understandable drawings of sailplanes and gadgets. Many of RCSD's covers in the last three years have been drawn by Bob from scratch! A true professional, Bob's work has always been on time and has always been exactly what I asked for.

Now, Bob will be leaving us to carry on his graphics work for a new "boss". It seems that Bob's work has so captivated the attention and praise of one of his regular clients that he was made an offer that he can't refuse! Bob will be working full time for that client instead of running his own business. This will give him more time for pursuit of his own interests and, hopefully, a better income and steadier work with which to acquire a fleet of new sailplanes and a suitcase of new radios!

To say that we shall miss Bob is an understatement. He is an artist, a modeler, a glider pilot, and a FRIEND. Without Bob's skills, RCSD wouldn't be where it is today. Thanks, Bob. Good Luck and God Bless. On behalf of Peggy and myself, and all of our readers, we wish you the very best future. May all your thermals be wide and your landings soft. (JHG).

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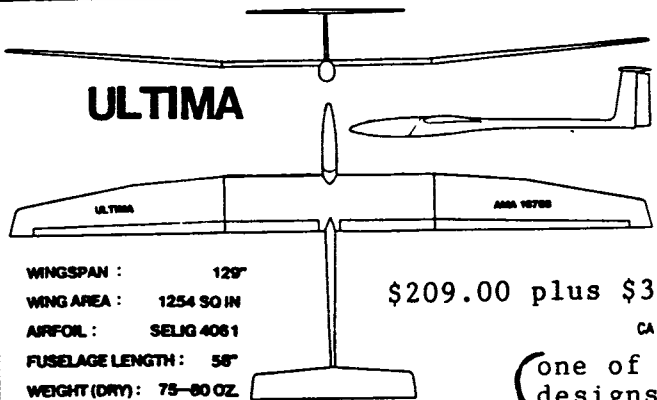
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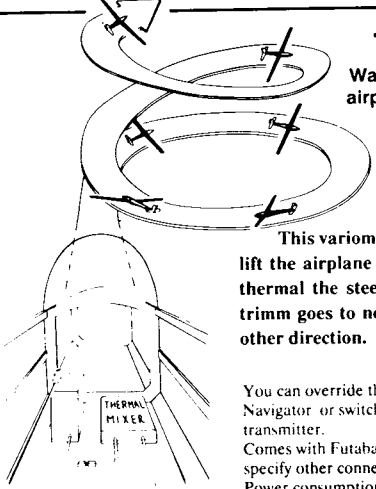
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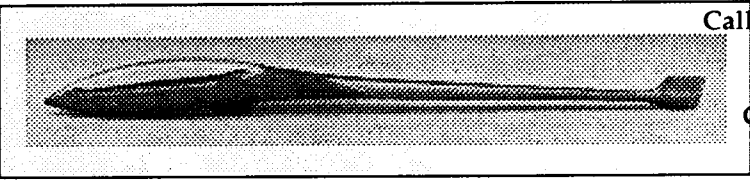
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