

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.

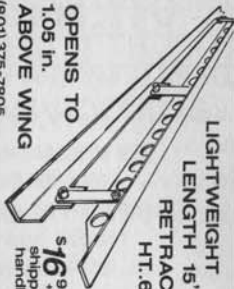
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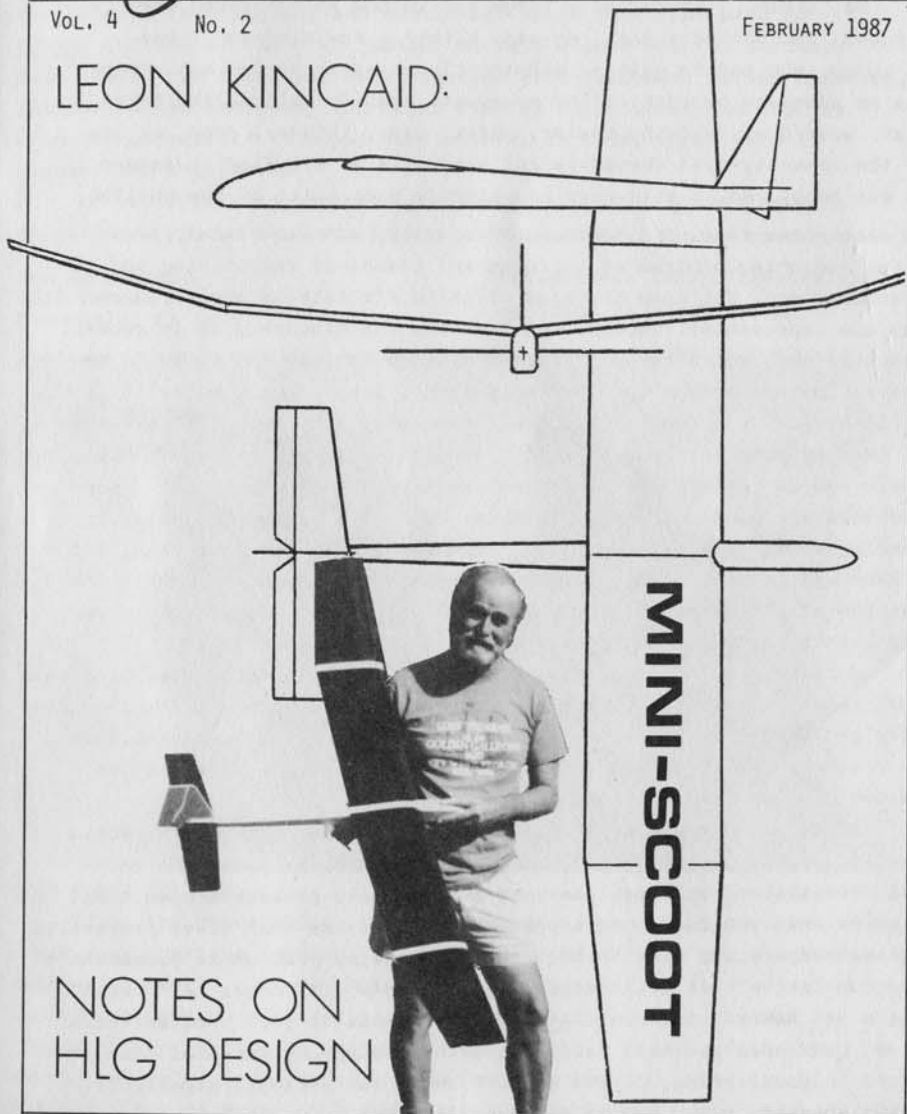
R/C Soaring

D I G E S T

Vol. 4 No. 2

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LEON KINCAID:



NOTES ON
HLG DESIGN

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HI START

This editorial is a matter of life and death! It concerns your health and mine, and I'm not kidding. The story began about twenty-five years ago when I was a project engineer with a large company where a project required I work with epoxy resins and hardeners, amines, toluols, toluenes, methyl-ethyl-ketones, and a host of other organic chemical materials. Then, at about the same time, I started building a full-size sailplane that required the use of epoxy glues, urethane finishes, etc. One night, after spending a few hours in the shop (un-ventilated) I suffered a violent attack of asthma, sinusitis, and loss of sense of smell...all of which the doctor pinned down as an allergic reaction to the materials I used. He recommended that I cease for a few months and then cautiously try again -- this time with adequate ventilation and a breathing mask.

So, I did. I installed a large fan in the shop, opened the windows, and donned a mask. No use! Within a few minutes, I was in agony, and had to quit -- permanently -- as it turned out. There was no adequate protection for my system against things like balsa dust, wood dust, sanding sealer, paint, glue, thinner, dope, or any of the commonly-used chemicals and materials we all find necessary in our hobby. So, I sold what had already been built of the BG-12BD.

At about this time, I discovered RC soaring, and immediately began a self-teaching program of building and crashing; re-building and crashing, etc. You know the kind of thing I'm talking about. There was one improvement, though, and that was the discovery of CA cement, which allowed me to re-build faster after crashing, and to build new planes faster. From about 1973 to present, I have built maybe 50 sailplanes...or a hundred...I can't remember; but, what I DO remember is that my problem returned with a vengeance! In particular, epoxies, dopes and CA cements caused violent asthma-like attacks PLUS vision problems and sense of smell problems. For three years, I completely lost my sense of smell and taste! Fortunately, it has come back, but I have had to stop the use of these common building materials. I CAN use the aliphatic resins and white glues, and the plastic film covering materials...but that's all, at least until recently.

I discovered a 3M chemical-filtering, dust-filtering breathing mask that seems to allow me to use the noxious chemicals in a limited quantity and for a limited time. Use of the mask is not pleasant because it interferes with free breathing and with vision...but it's a lot better than not being able to build at all!

Friends and readers, these things not only affect your bronchia and lungs, but possibly the brain, as well. PLEASE, please be careful. Ventilate your shop; use fans and positive pressure; open the windows when you can; wear a protective mask: one that gives protection against vapors and dust. Also, remember that my problem is permanent - and cumulative - it will never go away, and I will never be "normal" again. BE WARNED, and don't ever let it happen to you, because there is NO CURE once you have reached a saturated accumulation of this stuff in your system. Try to learn from my own personal experience. Happy soaring, JTM

INTERNATIONAL SLOPE RACE ANNOUNCEMENT.....Bob DeMattei

The 21st annual International Slope Race is coming up again on May 2nd and 3rd near Davenport, California, between San Francisco and Santa Cruz. The format is head-to-head racing with four planes at a time competing over a two-pylon course...the "infamous figure-eight" course...which has not really been found to be as destructive as (mis)reported in some articles. Two days of "heat" racing (and "hot" racing, too...JHG) culminates in tie-breaking fly-offs among the eight top-ranked pilots who have survived the heats.

The ISR was started by the Santa Cruz R/C Bees and subsequently became the R/C Modeller Trophy Race run by the South Bay Soaring Society, and eventually became the SBSS-sponsored International Slope Race. The ISR is truly international, with participants (so far) coming from England and Australia. While there has been no winner outside of the U.S. (again, so far) a good deal of hardware has crossed the Atlantic. Participation from European, Asian, Canadian, Mexican, South American, and other foreign competitors, as well as more US competitors is hoped for in 1987. In 1986, there were 48 competitors registered.

We would like to invite any and all interested pilots to join us for this unique contest. If you are interested, please contact:

Bob De Mattei
1580 Parrot Avenue
Sunnyvale, CA 94087

Telephones: (408) 732-3009 (home)
or (415) 723-2950 (work)



MORE SLOPE SOARING.....Jim Riggle

"Jim: the cover photo of your December issue got me to thinking about your previous request for pictures...and we want you and the rest of the world to know that slope soaring is alive and flying in the Pacific Northwest. For the last couple of years, the members of the Portland Area Sloping Society have been actively looking for slope sites, and we've found quite a few. The only one I'm going to tell you about now is McKinley Ridge which runs north and south at about

3,900 feet, and is the 'top of the Cascades' at this point in the range. The prevailing winds almost always provide substantial lift, with the air raising some 2,500 feet as it flows over the ridge from either direction.



"Picture #1 shows the crisp conditions on December 6th, 1986. (Our pictures were taken after the contest was over) At the controls of Barry Kurath's WIZZARD (not pictured) are Eric Jackson, Barry Kurath (PASS president) and Al Halleck. Picture #2 shows Mike Bamberg launching his GRIFFON directly at Mount Hood (elev. 11,235 feet...and no, he didn't run into it!). Picture #3 is the Griffin in the same flight making a pass in front of Mt. Adams (elev. 12,307 feet).



Pic #4 is of Eric Jackson preparing to launch the PTERON he mentioned in the December RCSD. It was just a 'fun-fly' day. Ten of us braved the snow-covered loggong road for a day of glorious flying. The ridge is in the Gifford Pinchot National Forest, and next summer we plan to combine a camp-out, pylon race, and fun-fly at this site. It's only an hour from Portland, so it combines great flying with easy access."

(signed) Sincerely, Jim AMA #82034



SLOPE SOARING continues in future issues. Harry Finch, who was to have started his slope soaring column several months ago, and who did the review of the Scale PHANTOM jet in RCSD, has agreed to take on the formidable task of providing a monthly column, now that his personal and business affairs have let up the pressure a bit. Look for Harry soon!

SCALE, SCALE, AND MORE SCALE.....Jim Gray

Next month, I'm going to write an editorial that was intended for this month: concerning scale sailplanes and gliders. This, along with slope and cross-country soaring has been one of the most frequently asked for subjects to be included in RCSD...so you'll get more in the March issue of RCSD. Instead of srpeading out the letters and photos already received, I think I'll put them all in the "SCALE" issue for March. Please be patient, as you have a rare treat coming from folks like Sean Walbank of the White Sheet Club (WSRFC) in England, Cliff Charlesworth, noted scale modeler from England, and many more.

Friday, Saturday, and Sunday - November 28th, 29th, and 30th, 1986.

Friday (11/28): SPORT SCALE: four entries

- 1. Tom Beckman - TG-3
- 2. Bud Moore - TG-3
- 3. Woody Blanchard - CG-4A
- 4. Len Postage

2-METER (EXPERT): 21 entries

- 1. Ed Berton - Pod & Boom original
 - 2. Nelson Montgomery - Scooter
 - 3. David Stone
 - 4. Malcolm Smith
 - 5. Lee Montgomery
- Note: room only to list first five

2-METER (SPORTSMAN): 21 Entries

- 1. Jeff Eicher - Gentle Lady
 - 2. Tamara Wetterman - Gentle Lady
 - 3. Nathan Miller - Gentle Lady
 - 4. Karl Strayer
 - 5. Len Postage
- Note: room only to list first five

Saturday (11/29): OPEN CLASS (EXPERT): 28 Entries

- 1. Tony Rogers - Sailable
 - 2. Ed Berton
 - 3. John Gunsaulus
 - 4. Malcolm Smith
 - 5. Bill Schell
- Note: Room to list first five only

OPEN CLASS (SPORTSMAN): 20 Entries

- 1. Louis Gray (no relation to editor!)
- 2. Art Loucks
- 3. Don Slater
- 4. Jeff Eicher
- 5. Erel Linn

Sunday (11/30): TRIATHLON (EXPERT): 26 Entries

- 1. Woody Blanchard - original design
- 2. Tony Rogers
- 3. Tom Tock
- 4. Malcolm Smith
- 5. Bob Wilkosz

TRIATHLON (SPORTSMAN): 22 Entries

- 1. Rusty Smith
- 2. Don Slater
- 3. Jeff Eicher
- 4. Louis Gray
- 5. Art Loucks

Tony Rogers, a med school student from U. of Miami, was Grand Champion in Expert. He had five perfect 7-min. flights on Saturday, and lost only 55 landing points! In scale, Woody Blanchard tried a "zoom" launch

Tangerine (continued).....

with his CG-4A (WWII Cargo Glider) on his second flight: instant dis-integration! Tamara Wetterman, 2nd-place "sportsperson" is also a senior med-school student at U. of Miami, and the only female contestant. Nathan Miller is the son of long-time modeler Blaine Miller, and gets his full-size sailplane rating when he is old enough. He has nearly 100 hours in a BLANIK! Jeff Eicher is a full-scale aerobatic pilot, flying a Christen Eagle in airshows...has been modeling for less than one year! John Gunsaulus flew "the thing" which is his Manata Ray twin-boom design inherited from Daedalus. Tamara won a subscription to RCSD for her second place in 2-meter sportsman.

The Tangerine is well noted for its nice location, excellent weather, and appropriate timing just after Thanksgiving. Attendance of modelers from Virginia, Tennessee, Ontario, New Jersey, Maryland, Illinois, Alabama, and (a bunch from) Florida was noted. Thanks, Bud.

oo0oo

JUST FOR FUN.....Jim Gray

Jim Tolpin, founder and president of the Interwood Company, is producing a series of small, all-wood, hand-launch gliders for indoor and outdoor use. These are super little gliders with capability of flying for up to 20 sec's indoors and a minute/^{or so outdoors}with proper rigging and "flinging". Results to date have shown times of about 40 seconds. They are sensitive to adjustments and teach proper rigging.

You can build the little CERRITO for yourself, a friend, your children, or just about anyone. They make a wonderful and thoughtful gift, and come packed two on a cardboard-backed blister pack. A full instruction sheet for building and flying, including contest flying, are included. I built two of them in about fifteen minutes, which included sanding the wing to airfoil shape! If you've wondered what to do with the kids at an RC contest, or what to do on a rotten day when it's raining, or when thermals (or slope) aren't working, then trot out these little gems and have at it! Write to Jim for details, c/o THE INTERWOOD COMPANY, P.O. Box 681, Port Townsend, WA 98368. Hey, where can you have this kind of fun for less than \$5.00 in this day and age? It ain't RC, but it sure as heck is FUN, and you ought to see them soar on a small slope!!! Get one (or two) now.

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A CHUCKER'S GUIDE - or (HOW TO DESIGN YOUR VERY OWN R/C HAND-LAUNCH GLIDER) by Leon Kincaid.

Leon Kincaid really needs no introduction to glider pilots everywhere, as he is both a prolific designer (SCOOTER series) and hot competitor (see RCS, November 1986). In recent correspondence I asked Leon to provide us with an article of his own choosing...and this is the result. The MINI-SCOOT on the cover is Leon's design which came to fruition as a result of the deliberations set forth in this article. Enjoy! (JHG).

"This is going to be very non-technical, so don't expect any fancy aeronautical terms...primarily because I'm not qualified to use them. This is just a guide!

"There are three ways to design a new class of model:

1. To copy the basic outline of a good, successful and proven design;
2. To have the technical expertise to compute and design a model for a specific mission; or
3. To establish a set of standards based on as many successful designs as available, and then to try and be original using these standards as a guide.

"I like the last method best. It allows me to be original and still know I am in the right ball park of platforms and configurations. I think it was about 100 years ago that I used to fly free-flight models, and I dropped out of flying for many years. When I decided to get back into flying, many things had changed. No more spark plugs, coils, etc. They now had 'glow' engines with more power so the aircraft designs had changed also.

To update myself, I bought the latest model magazine annual (AirTrails, I believe). In those days the Annual Specials would print the first five-place Nat's winners in each class, with data on each winning design such as wing span and area, engine, propeller, fuel, etc. By taking this data for the five Open and Senior winners, one could average the 10 best designs available and establish a "standard" as a guide. At least this would give me, or anyone, a good starting point in a specific class.

"I had been designing my own R/C sailplanes, including my first one, since 1972. Hand-launch, however, would require a little something special: I figured the fuselage should be longer than normal sailplanes, based on the built-in stability required (as also found necessary for free-flight hand-launch gliders). On standard-size sailplanes with an average aspect ratio, I could usually multiply the wing chord by 2.3 or thereabouts, and thus determine the gap between the wing trailing edge and the stab leading edge. However, in order to increase the area of a HLG having a restricted span of 59½", many designers (including myself) have increased chord widths. Consequently, using a standard factor times the chord could result in some unrealistic fuselage lengths. Likewise, a very small chord could - and would - result in an extremely short and tricky fuselage or tail moment arm.

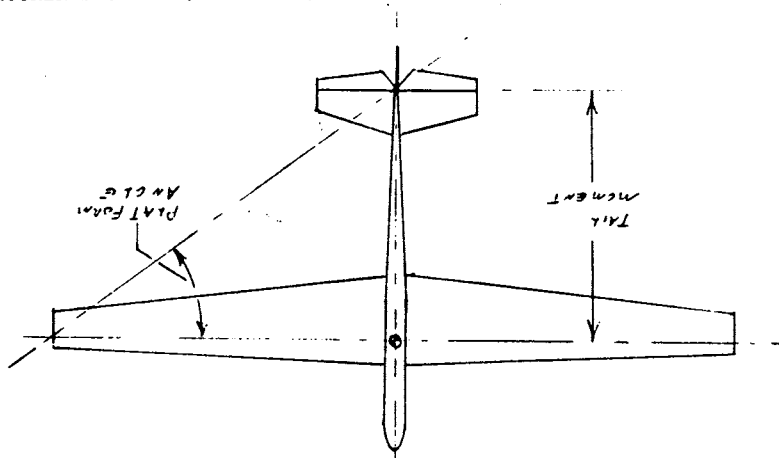
"The other area I was not too sure about was the best angle of dihedral to use. I figured it ought to be increased, but how much?

"So, where do we go? There aren't any more Super Annuals with Nats data available (boy, here's a great idea for an article, somebody...who will be first...JHG). But, Sean Walbank, editor of the White Sheet, an excellent R/C sailplane publication from Jolly Ol' England, printed a "Hand Launch R/C special" in 1985. It listed many HLG's with three-views, so I selected 8 of the best-known gliders after excluding the smaller 1-meter span size, I averaged the fuselage lengths, dihedral angles, and tail surface areas. I didn't measure the fuselage length in inches, but instead I measured the "platform angle" of each, based on Hi Johnson's method, as follows:

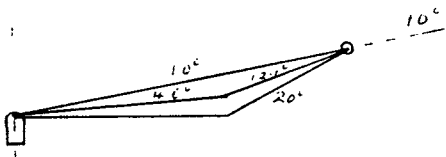
The eight designs were: Zephyr, Sunbird, Tercel, Meadow Lark, Ree Gull, Flipper, Soar Arm, and Flinger. Here are the average statistics:

Platform angle.....36 degrees
 Dihedral angle.....10 degrees (overall, or vee)
 Polyhedral angle...4.6 deg. center; 12.1 deg. tip
 Tipdihedral angle...center panel 0 deg; tip 20 deg.
 Stab area:14.8% of wing area
 Rudder area: 7.2% of wing area

On the subject of platform angles (also called platform angles) Hi Johnson says that the line running through the wing should go



through the c.g. , but on hand-launchers the decalage is so low that the c.g. is liable to be rather far aft in final trim. My guess would be to measure it from the center of pressure, or simply down the main spar...it's not that critical...but a starting place. As shown in the drawing, I found the average platform angle to be 36 degrees. On the average standard-size sailplane, the angle would be more like 27 degrees. To calculate your own fuselage length or tail moment arm multiply the tangent of 36 degrees (.72655) by one-half of the wing span. For a span of 59½", the tail arm becomes 21.6". You won't believe this, but I drew up a HLG design several months ago before I determined these angles...but I swear mine was right on 36 degrees - honest! However, I was off in another area, knowing that I should have added more dihedral



Although each HLG measured had different size wing panels, but the average angle of the center panels was 4.6 degrees, and the tip panel angle was 12.1 degrees. I have now changed my drawing to 5 degrees and 12 degrees, and my next HLG will use 4 degrees and 14 degrees. Why? Because when I land on a flat surface and the glider tilts over, the tip of the stab just barely touches the ground before the wing poly-break touches, making it easy for the stab to snap off. (Heck, why not put a tee-tail or vee tail on it, Leon?JHG) I could make it 4.5 degrees and 13 degrees and add about 1/4" to my tailskid...no big deal but something to think about anyway.

Actually, it's the size or length of the wing panels that determines the size of the specific angles. As indicated on the dihedral sketch if you draw a 10-degree angle from the wing root to the wing tip, and put a dot at the end of the wing tip, you can draw in whatever length of wing panel you want, as long as the tip ends up at the 10-degree dot. If you want a flat center section with a tip about 14½" long, the tip will have to be set at about 20 degrees. If you like a straight dihedral, it will naturally end up at 10 degrees. I highly recommend that you stick with the average experts and choose a "poly" wing with the average angles, but not less. Straight dihedral is squirrely, tipedral (flat center section) is so easy to build and thermals well, but can "slip" into the circle when flying speed gets too low. A "polyhedral" wing just grooves-in the turn best.

For a few added tips:

1. Don't make the tail surface areas any smaller;
2. If possible, avoid constructing stabs and rudders from sheet wood. Built-up surfaces save a lot of weight in the tail section. Less tail weight means that a super strong fuselage is not required, and less nose ballast is needed.
3. Don't make the nose section any longer than necessary. Some builders atick all their radio gear way out in front so they don't have to add ballast. Bad idea. When it stalls, it really stalls! Better to keep the nose short, the tail light, and add nose weight (if needed) to keep it stable.

You may think that the tail areas shown are rather large, especially with what appears to be an extra-long tail moment arm...but remember that these little hot rods are leaving your hand at up to 50 mph and they need to be super stable. Just think: they don't put feathers on the back end of an arrow for nothing. I'm sure there will be considerable ideas and/or opinions on airfoils in the next few years, and I guess I still think free-flight airfoils for HLG's. It's my personal opinion that they should be thin, but with the highest mean camber you can get in a thin airfoil. This means a minimum of Phillips entry and a small leading edge radius. I'm presently using a flat-bottomed 8% thick airfoil with a very small leading edge radius. Time will tell (if my back holds out) how good or bad a choice it may be. If you want to stick with the tried-and-true Eppler 'foils, then my guess that an E174 or E176 might be a good choice.

You might also try turbulator strips on the upper wing surface between about 5 and 25% of the chord. Use thin strips of pin-striping material. If your glider comes out a little heavy, they may help. If your glider happens to come out extra light, the turbulators may be detrimental. If normal pin striping causes your plane to stall or be unstable, try thinner strips. Monokote trim sheet is only .0025" thick and will make a difference - one way or the other. They are worth a try.

"As I said at the beginning, this is just a guide, but I'm sure these simple standards will put you on the right track for a safe combination of aeronautical platforms. Likewise, I'm sure that each standard can be altered and/or improved. The final flight performance will depend on your ability to fine-tune the decalage and c.g. location...the most important settings being for the fast and slow speeds required. Good luck and have fun.

"P.S.: If you don't agree with anything I've written, don't write; I'll agree with YOU!

The SELIG 3021 AIRFOIL.....R.J. (Dick) Edmonds

R.J. and M.W. Edmonds are the proprietors of EDMONDS MODEL PRODUCTS, High Wycombe, England. This firm produces kits for the famous Algebra series of gliders, designed by Sean Bannister. The current one is the Algebra 2.5M which employs the Sellig 3021 airfoil. Here's Dick to tell us more...

"When I received SOARTECH no. 3 I was very pleased to find a variety of wing sections especially designed for Thermal Soaring by Michael Selig. At the time I was looking into the design of a 100" version of the ALGEBRA range (now finalised as the 2.5M). What I was looking for was a model to fill the gap between 2M and 3M, the performance of which - particularly in regards to speed - to be nearer the 2M and also to be capable of competitive thermal soaring in weak lift and low winds. After studying the numerous sections, I decided to try the S3021-095-84. The 095 relates to its 9.5% thickness and the 84 to the year when designed. What attracted me to this section was its similarity to the Eppler 205, and the claim that it was superior to the E205 at high angles of attack whilst the performance at low angles was equally good...and the drag produced being of a low order. Being semi flat-bottomed, it would also be easy to produce.

"The first test flights were very encouraging and it reacted in a very positive way when encountering lift, gaining height in even the weakest bubble. Several more wing sets were then made up and given to experienced flyers to check the performance independently. It was agreed that Michael Selig had got this section right. Because it was good in light lift and low winds, and outstanding in strong winds, it could be flown under the latter conditions with little or no ballast; far better than most of the popular sections now being used. It was concluded that this section would be ideal for those days when the wind varies very quickly. You know what I mean: when it's your turn to fly, the wind drops and you take the ballast out. You get into the line to launch, and just as you are ready the wind picks up to 15 or 20 mph... and no time to put the ballast back in again. A model with the 3021 would cope with this situation better than any other section I have tried. To do well at thermal soaring, the model must be ballasted correctly

for the prevailing conditions, and the pilots who judge this correctly give themselves a better chance than those who do not. So a section with wider operating speed ranges must be advantageous to us pilots who sometimes get it wrong.

"A model with this section would be ideal for the non-competitive flyer who does not want to go to the bother of adding ballast; he could then fly satisfactorily in quite strong winds. This section has now been tried on the ALGEBRA 3M, and it has proved just as good as the ALGEBRA 2.5M. Like all sections, it has its own operating characteristics: it is better when flown fairly fast; it reacts to lift in a positive way at the faster speeds; it can also be trimmed back to minimum sink which is surprisingly low...at speeds slow for this type of section. The speed differential between minimum sink and best glide angle is the greatest I have experienced. One small problem I encountered was insufficient elevator trim range on the transmitter at the elevator throws I normally use. This will depend, however, on the transmitter you are using, at least to a considerable extent.

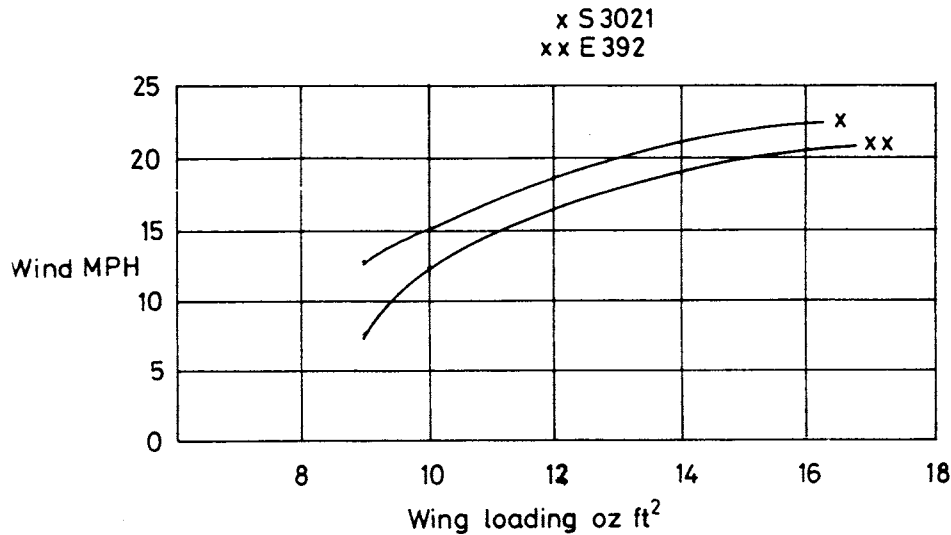
"I have now attempted some comparisons between an ALGEBRA 3M with the standard E392 wing section, and one with the S3021. The first question people ask is: what section is the best? All I can say is that they are different; one will be better for one set of conditions, and the other best for another. For example, if the wind strength is very low, say below 5 mph., and there is virtually no lift at all...just neutral air...then the E392 would be the preferred section. On the other hand, if the wind speed was over 20 mph., the S3021 would be the one to use; the main reason being that the S3021 would require far less ballast. The E392 will perform satisfactorily at the higher wind speeds, but the wing loadings required to maintain adequate penetration would need to be 17 ounces per square foot! This, in fact, actually doubles the weight of an unballasted ALGEBRA 3M, an undesirable feature which does not improve my landings! When the wind speeds and thermic activity are within what I would term the normal range - say from 6 to 16 mph. - and thermals of moderate frequency and strength - then there is very little to choose between the E392 and the S3021. However, a somewhat different flying technique will be required. The S3021 - having a flatter glide angle at speed - will be better for covering larger areas of sky when seeking lift; but, the E392 has an advantage in slow-moving lift, having the ability to stay in the lifting area and make most use of it. To a large extent it will be the personal preference of individual pilots, some of whom will prefer the E392, and others the S3021. The more adventurous pilots will probably prefer the type of flying offered by the S3021 which really comes into its own on the slope. By its very nature, slope soaring is performed in a wind which is converted into slope lift mixed with thermal lift.

"The S3021 has the most positive reaction to lift of any section I have tried; the rate of climb in lift is extremely high. Good lift can 11

SELIG 3021 Airfoil (continued)...

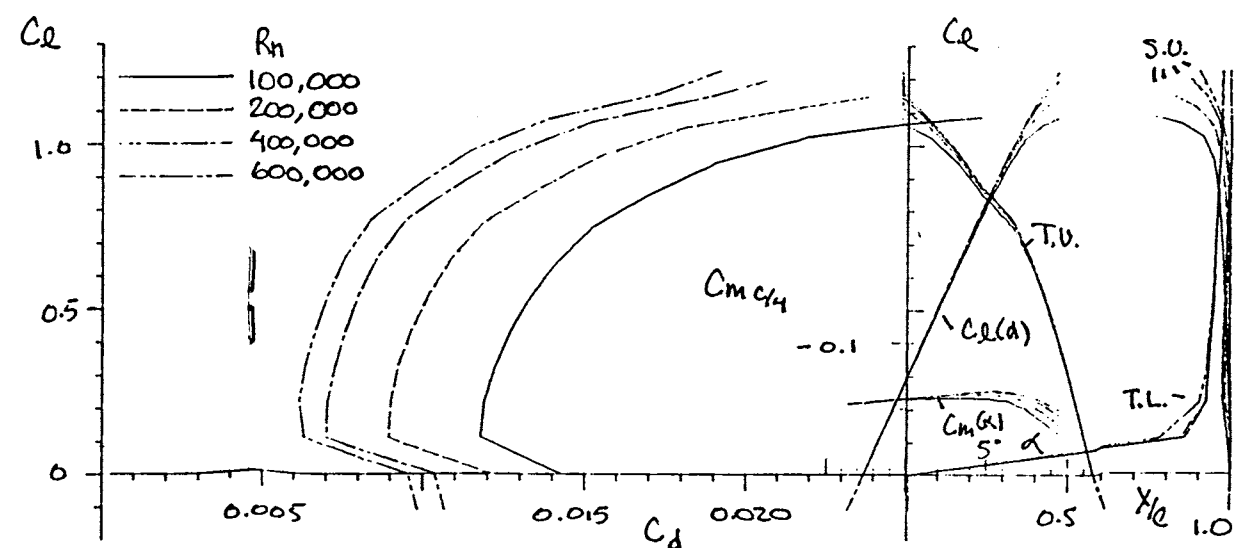
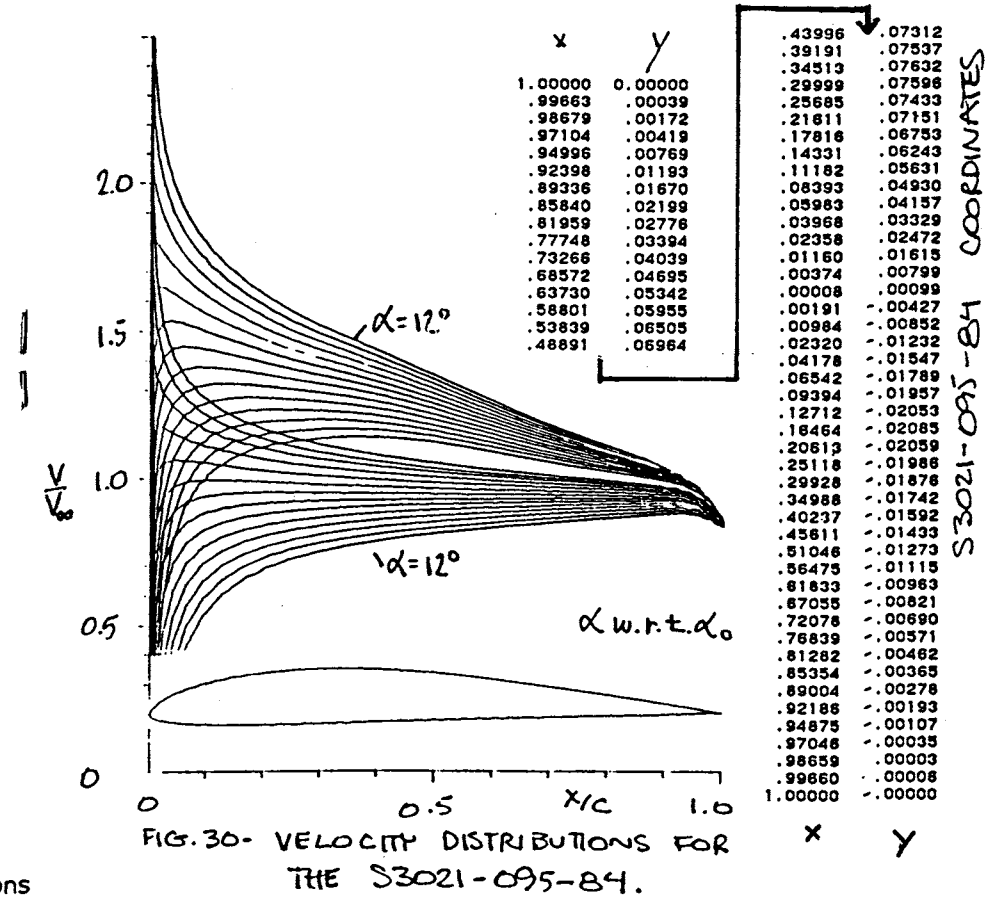
also be converted into high speed by this section, as on entering good lift, the model can be seen to accelerate very rapidly. This should make it an ideal section for slope cross-country (a different type of x-c than we recognize in the U.S....JHG).

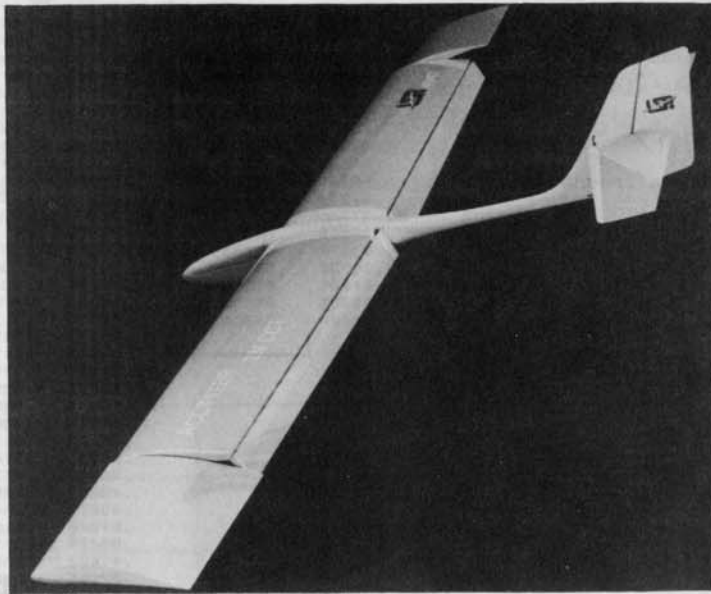
In SOARTECH No. 3, there were 15 Selig sections shown, and if they are all as good as the S3021-095-84, then in future I'm sure we will all see many more pilots using Selig sections.



Algebra 3M ballast requirements with E392 and S3021 wing sections when used for thermal soaring

THEORETICAL BOUNDARY-LAYER SUMMARY TABLE									
AIRFOIL	*-LAMINAR SEPARATION BUBBLE WARNING								
	O-NO SEPARATION BUBBLE WARNING								
	●-NO BUBBLE, TRANSITION BEFORE 0.05C								
	--SEPARATION AT LEADING EDGE (STALL)								
3021-095-84	+-ANGLE OF ATTACK WITHIN DRAG BUCKET								
ALPHA (deg)	REYNOLDS NUMBER								
	100000		200000		400000		600000		
	us	ls	us	ls	us	ls	us	ls	
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+9	*	*	*	*	*	*	O	*	O
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BUILDING THE ACCIPITER OCT......Jim Gray

The ACCIPITER is a tipperon-controlled sailplane produced by Jeff Morton at CALIFORNIA SOARING PRODUCTS, P.O. BOX 367, TOPANGA, CA 90290; (213) 455-2808. My own kit arrived via UPS in a large and extremely sturdy box. When opened, the contents are revealed as rolled plans, flat balsa sheet, beautifully made fiberglass fuselage, foam cores in their beds, and "unit" packages for fuselage, wing, and tail. These unit packages contain absolutely everything you will need to complete your kit except for paint and covering material...and possibly wing sheeting tape if you choose to use that method of skinning the foam cores. I was impressed with the completeness and quality of the kit, and found it to compare equally with kits produced by Airtronics for example. All necessary hardware, control cables, cut-to-shape and size plywood for root ribs and fuselage formers, clevises, horns, tubes, nuts, bolts, etc., etc. Each "unit" is in its own sealed plastic bag...making it very easy to choose the right components as you tackle the various building steps. The instructions complement the plans nicely, but must be carefully studied in the light of the plans as there are some unusual features included in the construction. Jeff tells you how to skin the wing cores outside of their foam beds, a somewhat different departure from what I'm used to, but simple when you realize how it's done.

You can find a description of the ACCIPITER in the September 1986 RCSD, pages 12 and 13; and on page 1 of the November '86 RCSD.

Cal-Soar provides two versions of the ACCIPITER: a standard aileron version, and the tipperon version. Tipperons give very smooth and responsive roll control, according to Jeff, and are especially

suitable to slope flying and aerobatics, where the Accipiter really comes into its own...although the thermal performance is excellent with either version.

SLOW epoxy is recommended during construction for those parts where epoxy is called for. Otherwise, CA cement is used for joining the wood parts. I used aliphatic resin (Franklin TITEBOND or Elmer's CARPENTERS WOOD GLUE) because I am very allergic to CA cements. This adds a bit of weight and is slower to cure, but results are good. Speaking of speed, it is best not to hurry the construction of this sailplane because there are some quite different procedures here and there to be followed precisely. Using a slower-curing glue, as I did, tends to insure that you will spend time studying plans and reading instructions as you wait for the parts to dry.

I began construction with the all-moving stabilizer and rudder, selecting the parts from the tail "unit" package. This went pleasantly fast, meaning that I now had to face the job of doing the wings or the fuselage, so I chose the wings next. First, you make up the spars and wing-joiner boxes on the plan, and glue the completed units into the pre-cut slots in the foam cores. The tipperon pivot blocks are added next. These are pre-drilled for you and are inserted into cut-outs in the foam. Channels for the push rods are also pre-cut into the cores, and I ought to mention that these cut-outs are all very accurately located, precisely to plan. No guesswork or chance of

goofing up the details, unless you're worse than I am at building, and I can't conceive of anyone being a less skillful builder! I skinned the wings in the old-fashioned way (using the foam core beds) because I was not at all sure that I could do them as Jeff recommended, and I didn't want to make a bad mistake. I used Viking Models (Hy Johnson) Super Tape obtained from Jerry Slates, and the skins went on quite easily and lined up well. Leading edges are added after skinning, and when the wings seem complete, the flaps are cut out and prepared by adding the flap spars. Hinging can be by any method you like, but don't hinge them until they (and the wings) have been covered. I found that the tipperons moved freely and without any "play" or "slop" in their motion...something that really worried me from the start. I needn't have bothered worrying, as the instructions almost guarantee success.

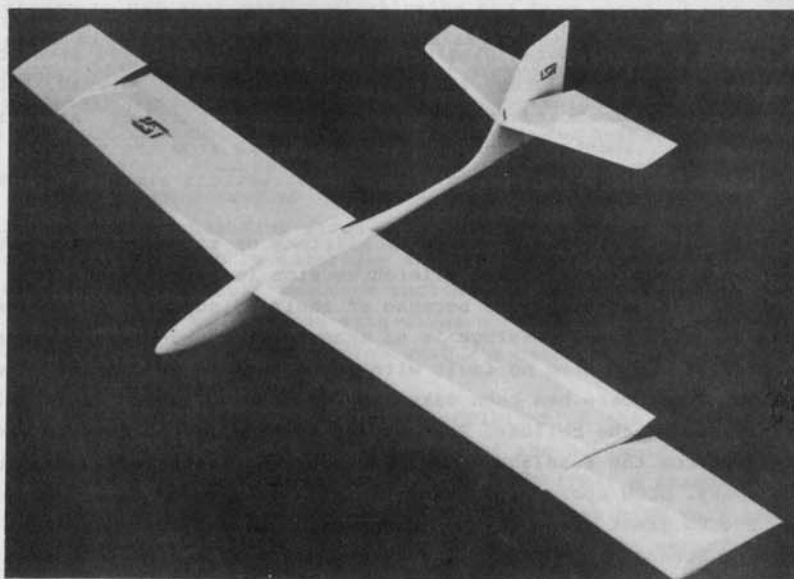
Cal-Soar gives you a choice of ailerons or tipperons when you order your kit. The standard aileron version is slightly cheaper. I liked the idea of tipperons because of their uniqueness, so ordered them. The fiberglass fuselage is an example of epoxy-glass layup at its best. I could find no fault with the materials or quality of workmanship. Great care has been taken in its forming, which makes life a LOT easier for the builder. Pre-cut and shaped plywood formers are selected from the fuselage "unit" package, and installed in the fuselage with epoxy. SLOW epoxy takes time to align everything as it should be and cure to great strength and toughness. I used SAFE-T-POXY from Aircraft Spruce & Specialty, and some Hobby Poxy II for this job.

Accipiter (continued)...

The canopy block is already rough-cut to shape and all that's needed is a final sanding to contour. The plywood hatches for servo and control access are easily and quickly made, and all fit together to give a molded-in appearance when finished, but provide instant and simple access to the "innards". I used the supplied simple tow hook, but you may want to use a retractable hook...and the plans provide for this option. Your choice. Installation of pushrods, pivot points, wing support rods and joiner tube, etc., are all straightforward and uncomplicated. Again, you do have to take your time and measure carefully to insure proper alignment and matching of components when assembled. As an old German used to say: "measure twice and cut once." He was a real craftsman.

All-in-all, construction time was three weeks up to the point of final finishing (covering and painting) and radio installation. I planned to use my ACE Silver Seven airborne radio, but found that my standard mini servos are too large to comfortably fit the narrow fuselage, so I plan to order the micro-sized servos. I think I'll cover the wings with one of the plastic film coverings and paint the fuselage in a matching (or maybe contrasting) color.

There are some sailplanes that "look right" from the first, and these usually fly right as well. The ACCIPITER CCT is one of these, and I anticipate hours of soaring with this slim and nimble bird. Preliminary weighing, plus a little guesswork on final weight of paint and covering, shows that the flying weight will yield a wing loading of about 10 oz. per sq. ft., or a tad more...somewhat below Jeff's advertized loading. I'll let you know how it flies in my next report, which is likely to be a couple of months away, as we are under two feet of snow as I write!



A PROBLEM NEEDING ATTENTION?.....Chuck Holland

Chuck Holland has received some letters that he has been circulating throughout the AMA to get greater awareness of the INEQUALITIES between RC soaring and other RC activities recognized by the AMA. Chuck has asked me to reprint these (unsigned - but writer known) letters, and I gladly do so herewith. I did write to Chuck, and mentioned that perhaps one of our greatest assets in the AMA at present is our own Jeff Troy who now occupies the position of Assistant PR Director. Jeff comfortably wears all three "hats": modeler, competitor, and leader member/official of AMA. He is very keenly aware of the soaring scene from all aspects, and -possibly - inequalities within the organization's perspective. I think that we all feel free to comment on these matters to me, to Chuck, to Jeff, and to your District AMA VP. Please do so, if you have a position to take or a concern about these things. JHG

Charles E. Holland
36D Landmark Drive
Columbia, S.C. 29210
AMA 77170

December 23, 1986

Dear Sirs;

After attending the 1985 Nationals in Mass., I started wondering why the Sailplanes always get shuffled off to some auxiliary site. Sailplanes are the largest single event in the Nationals and deserve more attention that to always shuffled to some out of the way location. Why not rotate the main site between the RC events and let the RC Pattern event share the time at the auxiliary site? Visitors need to see RC Sailplanes contest and I would like to spend some time between rounds viewing Free Flight, Control Line and other aspects of the hobby.

It is time for some equity between RC events attending the Main Site location at the Nationals and I would appreciate this consideration at future national contests

Sincerely Yours

Charles E. Holland
36D Landmark Drive
Columbia S.C. 29210
AMA 77170

December 22, 1986

Dear Sirs:

It has come to my attention while planning our upcoming sailplane contest, that a disparity exist in our current rulebook for RC events. We were planning to hold a AA contest, with unlimited and standard classes

with a breakdown in experience levels of Sportsman and Expert. This would give us 4 sets of important awards. It was pointed out to us that the rule book only recognized (443) unlimited and (441) standard classes of sailplane and the breakdown between experience levels wouldn't count. Yet RC Pattern contests routinely enjoy AA status based on different experience classes ie. (401) novice, (402) sportsman, (403) advanced, (404) expert, (405) masters. This is the disparity that needs to be corrected. You need to recognize different experience classes in all forms of RC contest, not just Pattern. I have attended single A Sailplane contests that has more contestants than the AA South Carolina State Pattern contest.

Could you please make a proposal to change the rulebook to allow recognition of different experience classes in all RC events.

Sincerely yours

oOo

Letter from Dave Houck re Futaba:

A few issues ago, Dave Houck wrote about some minor problems he was having with his Futaba radio. Recently, he called me to say that his problems have been resolved. First, he discovered that Futaba (California) is the marketing and pricing arm of Futaba (Japan) which does the manufacturing only. Futaba did follow up on Dave's letter, expressing concern about the problem and offering to fix it in a satisfactory manner. Apparently, the major difficulty is the exceptional demand for these radios which has out-paced the supply! Dave asked me to insure all of you, and Futaba, that they take care of their customers.

ALTERNATIVE TOWING TECHNIQUES.....Jim Gray

Recently, RCSD has offered a series of articles by different authors describing aero towing as a means of launching RC sailplanes, and I've had quite a number of enthusiastic and inquiring letters as a result. Here's a means of involving the sometimes disinterested and sometimes downright hostile power-plane modelers in our activities. Even if they don't change their ways, they might at least become a bit more friendly at the club field, and tend to look with slightly more favor upon us glider-guiders.

Now, I'd like to discuss a somewhat different towing method...one that was used for many years with great success...automobile towing. There were two versions of auto tow: a straightforward and direct tow with the auto pulling the glider at the end of a long tow rope; and a slightly different version called the auto-pulley tow in which the automobile had a large-diameter pulley mounted on the bumper hitch or frame hitch (the latter being safer). How does this relate to US, you ask? Well, I'm not really sure that it does, but I'd like to propose an idea for someone to try.

What about getting an RC auto "nut" to tow your glider? Crazy? Maybe, but wouldn't it be a blast to have it work and use that technique to win a SCALE vintage contest? I think the auto would have to be fairly heavy to avoid having the glider pull up its back wheels, but I think it could be done.

One advantage of the auto-pulley tow over the straight auto tow is the fact that the car has to drive at only half the glider's launch speed, due to the mechanical advantage of the pulley. Here's how it works.

You stake one end of the two rope down in the middle of your field. Then, you pass the free end of the towline up through and over the top of the pulley, back toward the glider that's facing into the wind at one end of the field. The car then starts forward slowly to make the towline taut...and then proceeds to pull the glider into the air. When I used to do these types of tows in my old Schweizer 1-20 glider (full size) it was a real ball! You have the feeling of going up "feet first" at a very steep angle. The launch height before release is approximately 1/3 the length of the line available. For example, I would typically get about 350 feet from a 1,000-foot towline. That was plenty when we launched at the edge of the slope at Harris Hill, because the slope itself was 750 feet above the valley! In a flat field, you would like to have about 2,000 feet or so available in order to get a higher launch.

We used winches frequently, too, and these were powered by an automobile engine with a fluid drive transmission for steady and smooth pulling. Some winches incorporate a tensiometer so that a pull of a given number of pounds can be maintained. Some gliders tow with less of a pull than others...and I can tell you that it's exciting when you are pulled too fast!

Anyway, in the spirit of SCALE glider operation, I'd really like to see someone get together with a friend who is into RC cars, and try this system of launch. Who knows, maybe it's already been done... but if it has, I haven't heard about it. Have you?

SOURCES and HINTS.....Jim Gray

Boy, I've been having so much fun in the shop lately that I just have to tell you about it! First, I've been fooling around with epoxy and fiberglass cloth. The epoxy is called SAFE-T-POXY, and is obtained from Aircraft Spruce & Specialty company, 1-800-824-1930. They supply materials for homebuilders (EAA'ers) and others - including modellers. The epoxy can be obtained in nearly any quantity you need, and I've found that the starter kit is just about right for my needs. It contains approximately one quart of epoxy and enough hardener to meet the requirements of that quart. This stuff is excellent, and - so far - my normal allergies to epoxy and hardener haven't been triggered. Hurrah! The cloth I've been using was obtained from Aerospace Composite Products, Department "S", P.O. Box 16621, Irvine, CA 92714. It is a fine, almost gossamer, material at .3 ounces per square yard... the lightest I've found anywhere...and beautiful to work with and look at. Finally, I obtained some 91% Isopropyl alcohol from the local drug store for 'thinning' the epoxy and hardener so that it can be used as a varnish, and to make brushing easier. You mix the epoxy and hardener first, as usual; then, if the mixture isn't 'runny' enough, you add some alcohol. SAFE-T-POXY is very thin (compared to many others I've used) but for varnishing and for wetting out this very light, silky cloth, I mixed about 20% by volume of alcohol into the final epoxy-hardener combination. Now, it flows from the brush just perfectly, and wets out the cloth just like you want.

I've read in various places that a roll of toilet paper has been

used to "blot" up excess resin from a layup, but I've found a way that works better for me: kitchen paper towels. I take a square or two of paper towel and crumple it up into a loose wad, than dab lightly at the epoxy- fiberglass surface while it's still wet. All wrinkles disappear, excess resin is soaked up, and the glass cloth nearly disappears. This method is so neat and easy, I had to restrain myself from covering every surface in sight! Actually, on a couple of occasions, I've used double and even triple layers of this very light cloth, one on top of the other, with a little resin brushed on between layers...then dabbed with the paper towel after the final layer has been wet out. Then, to put a finish coat on a surface that needs protecting, I wipe it on with the already-wetted paper towel, using it almost like a paint brush.

Another inexpensive item I've found works very well to apply the epoxy to a surface is a common powder puff that you can buy at the cosmetics counter in the drug store. Years ago I used that to varnish the propeller on my old BC-12D T-Craft. It works great! (My wife wondered where her powder puffs kept disappearing to!).

One of the tricks for trimming to an edge is to do your trimming with a very sharp, new X-acto or similar blade, like a #11 for example. Weight until the epoxy/cloth combination is rubbery but not yet set, and then trim it by holding the free edge of the cloth taut, and then running the blade along the edge of the covered structure. Voila! It cuts away cleanly, without leaving loose threads or hurting either the blade, your fingers or the structure itself. Everyone knows that, right? Well, just in case someone doesn't, here it is for FREE.

PHOENIX..... (a bird that arose from the (cr)ashesJim Gray

Did I mention to you that my two-meter Hy-Bird (hybrid) "bit" the dust? Yep, totalled - due to a bad servo. Then, just a month ago, my Prophet was damaged badly in a crash...and the fuselage had to be thrown away. The wing, surprisingly, was repairable without any difficulty...but that left me wondering about a new fuselage. Should I build one from the plans, or...what?

It so happens that Ty Sawyer had one of the fuselages I got from my friend Tony Beckett in England. It was (is) a pod-and-boom of fiberglass. The pod was layed up by Tony and the boom was a scrap piece of fiberglass fishing pole, cut to length. Aha, thought I; might the two of these diverse creatures be combined into a sailplane? The boom already had a vee tail on it from one of Ty's projects that also "bit the dust", and he generously offered it to me as a consolation for the loss of Hybird.

The pieces amalgamated nicely, in fact almost perfectly. I added a small vertical sub-fin under the vee tail, to make it into a "Y" tail. This gives a little bit of extra vertical area, and makes a nice skid.

I molded some wing fillets to blend the wing into the pod, using some blue foam carved to shape and sanded to final contour. A final covering for strength was made with the .3 oz. fiberglass cloth and SAFE-T-POXY resin mentioned earlier. I'll let you know how it flies as

soon as it's finished and the weather permits. Just last week we got 20" of heavy, wet snow in a freak storm that took out power lines, trees, etc. etc., so access to our flying field has to wait until the snow melts a bit. Where the plows have pushed it up, the drifts are over five feet high in some places!

Anyway, the moral is that sometimes a Hybrid (HY-BIRD) works better than either of the originals components from which it derives. As soon as I can, I'll put a photo or two in RCSD to show you what it looks like. All I can say is that it looks very much like a mini-version of the GRAND ESPRIT made by Airtronics over ten years ago. I hope that it flies as well. So HY-BIRD II (for the second attempt, and also for 2-meter) is born. Stay tuned for developments.

oOo

ANOTHER HINT or TIP.....Jim Gray

In rebuilding the PHOENIX (above) and using that very light glass I wrote about earlier, I found it a bit difficult to hold the gossamer glass conveniently while trying to cut it. Almost by accident, it fell into a box on my bench...one of those cardboard cartons with the flaps on each side. I reached in, pulled out the free end of the cloth and layed it over one flap...where it stayed neatly. Since I needed to cut a strip from the cloth, I used the edge of the folded-out flap as a guide. Worked great. The box held the cloth, the flap kept the cloth from slipping back into the box...and served as a cutting guide in the bargain. Yeah, I know this is kinda dumb, and maybe not much of a hint or tip, but it sure worked great when I needed that extra pair of hands. I'll probably leave the glass in the box, and just close the flaps over it until I need it again. Why not?

I know that the 'pros' out there probably have their cloth on rolls, but for a beginner like me, simplest is sometimes best.

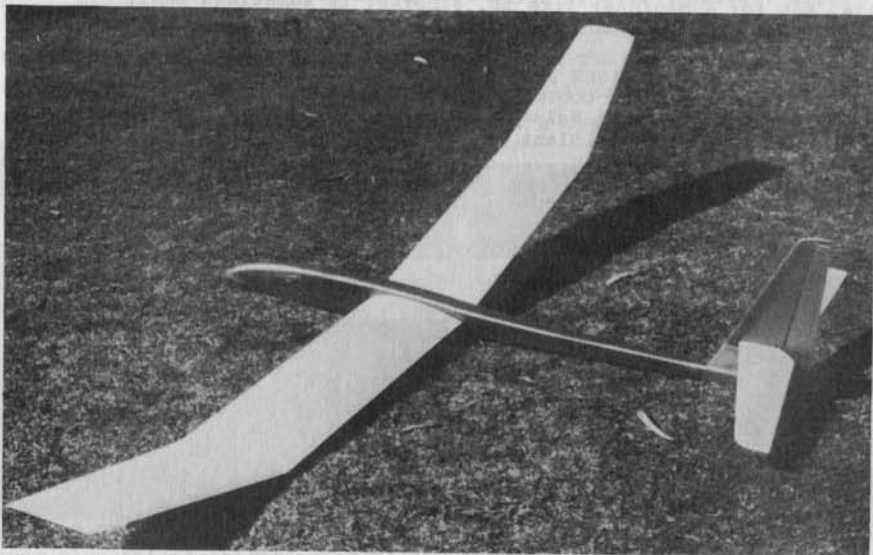
SOME VERY "ABELL" DESIGNS FROM DOWN UNDER
Photos and gliders courtesy Bruce Abell
Cessnock, New South Wales.
SCIMITAR 2-meter RC sailplane



features sheeted under-surface of wing.
Airfoil is BA-19 top surface; BA-12A
bottom surface. 12% at root, 10% at poly
break; 8% at tip. Two turbulator spars
between l.e. and main spar - top surface.

"ABELL"
DESIGNS

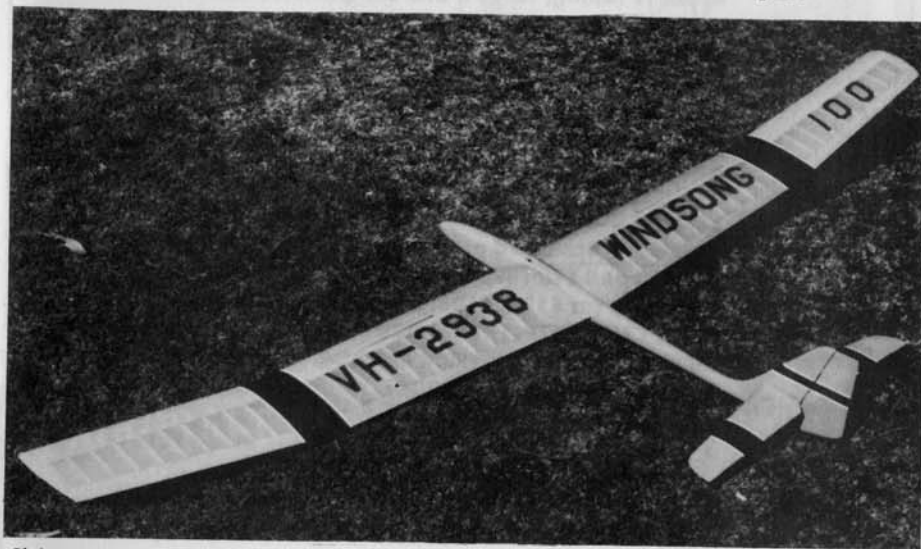
Inner panel swept back slightly, and tip panel swept forward slightly to cause airflow to move in from tip toward center, tending to minimize spill of air over the tip. Swept-back center panel tends to minimize airflow over the root and reduce interference drag at the junction with fuselage. Main concentration of flow will be inside polyhedral break, to increase lift. To date results appear encouraging. Comparison tests show improvement over "standard" wing without the sweep.



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with 14% at root, 10% at poly break, and 8% at tip. No sheeting on wing other than at root. Two turbulator spars top surface between l.e. and main spar.

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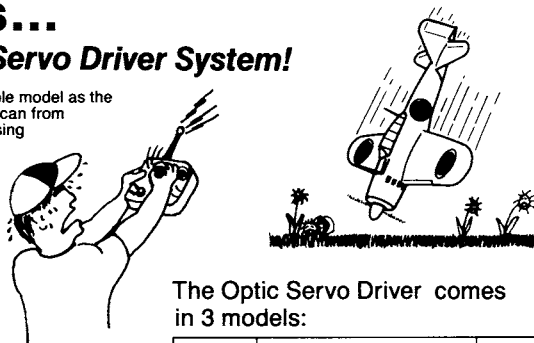
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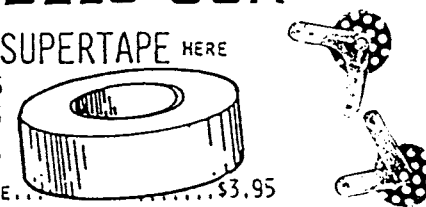
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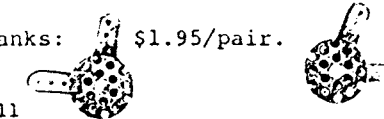
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