RC Soaring Digest
P.O. Box 269
Peterborough, NH 03458

BULK RATE
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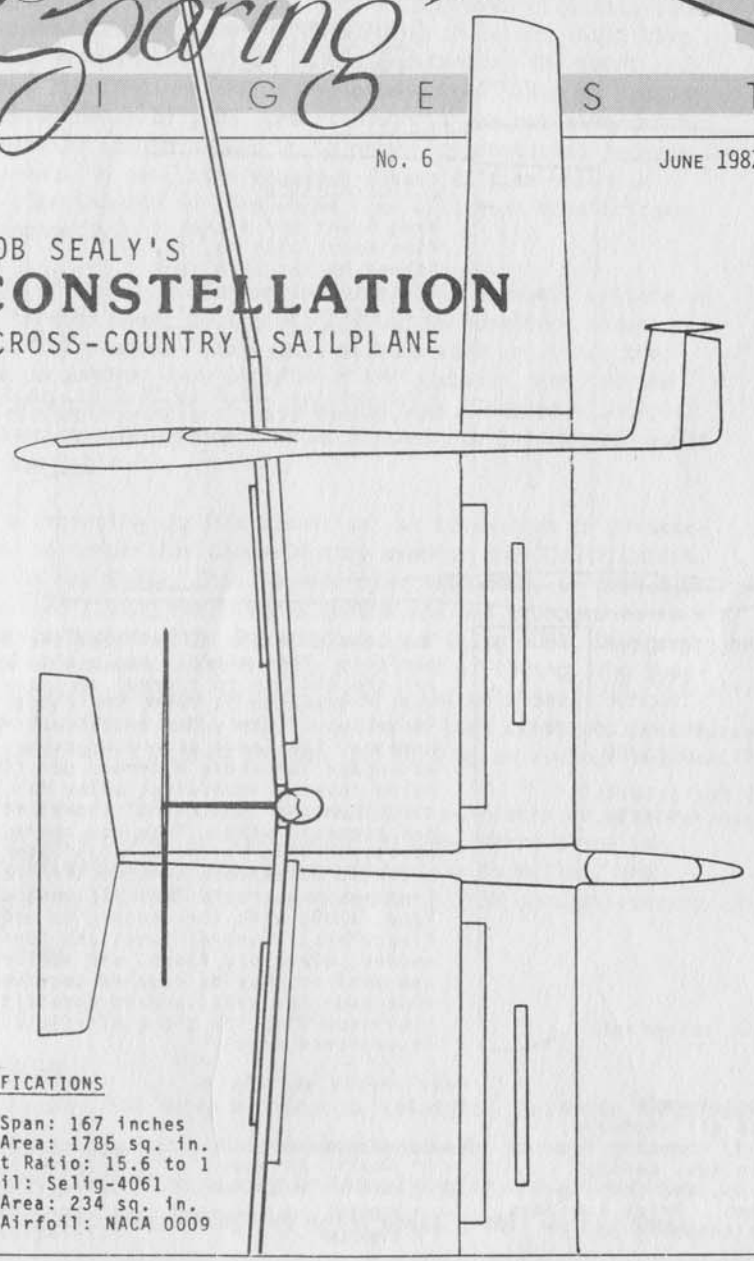
Graphic Design and Production by Robert Rondeau/Design Graphics

R/C Soaring DIGEST

VOL. 4 No. 6 JUNE 1987

BOB SEALY'S CONSTELLATION

CROSS-COUNTRY SAILPLANE



SPECIFICATIONS

Wing Span: 167 inches
Wing Area: 1785 sq. in.
Aspect Ratio: 15.6 to 1
Airfoil: Selig-4061
Stab Area: 234 sq. in.
Stab Airfoil: NACA 0009

HI START

THERE IS EVERY REASON TO BELIEVE THAT F3H WILL BECOME AN FAI-APPROVED EVENT...POSSIBLY IN 1987, BUT MORE LIKELY IN 1988.

As most of you know, F3H is an FAI designation for Cross-Country R/C soaring...an increasingly popular event both here and abroad...and once again it is the United States that has led the way. In fact, the cross-country records and contests held by U.S. fliers and clubs have become so well known around the world that many countries are planning cross-country events of their own. These events, not yet FAI approved officially, but FAI sanctioned for purposes of developing the event, will take place this year in the United States and Canada. The first FAI-sanctioned International F3H Championship took place in South Africa in December of 1985, and although it was not attended by many countries enough showed up to prove international interest in the event. So now, it's merely a matter of time-which is rapidly ripening-for an idea whose time will have come to take root permanently.

Many of the letters received here, from domestic writers as well as foreign ones, have been directed to questions about cross-country events. People want to know more about how the event is conducted, what sailplanes are suitable, and how the scoring is accomplished. RCSD welcomes this widespread interest and will do everything possible to disseminate information as it becomes available.

As a beginning in this direction, we take pride in presenting a new contender for Cross-Country events: the CONSTELLATION, produced by Bob Sealy. This 14-foot span sailplane, in prototype form,has been flying for several months now and promises to be a contender to reckon with. The airfoil is a Selig 4061, designed for large sailplanes suitable for this kind of flying. The fuselage is Epoxy/Fiberglass molded in the inimitable Sealy manner. The wings are foam-cored, and Bob tells me that construction can be undertaken and finished in just ONE WEEK by an average builder.

Elsewhere in this issue you will find a three-view of the CONSTELLATION and some of its specifications. Where there is one star, or group of stars, more are certain to follow, and 1987 should be THE YEAR for the emergence of F3H contest soaring.

Happy soaring,

Jim

SOARING MAILBAG

Steve Loudon, 504 North Washington, Lexington, Nebraska 68850 sent some really nice pix with an accompanying letter. He says in part: ",,, I thought you would enjoy seeing what's flying on the windy plains of South Central Nebraska. Though we are a small group, we fly about

MAILBAG (CONTINUED)...

every weekend...the next closest flying (greoups) being Lincoln and Denver. I'm just in the process of building a CUMIC PLUS to be added to my present CUMIC and METEOR. The larger planes seem to be well suited to our often windy days."

Cumic and Meteor.

Cumic, Meteor, Gentle Lady, Cumic Plus and Bird of Time.

MIKE HARVEY, 10 THE CROFT, STUBBINGTON, HANTS. PO14 2EY, ENGLAND sent in some super pix and a nice letter I'd like to share with you.

"In a recent issue of RC Soaring Digest there was a piece about a USA distributor for 'International Sailplanes', kits or plans. Enclosed is a picture of my daughter Karen holding my new I.S. Garth 100" (720 Sq. In.) model for the British 800 Sq. In. 100S Class. The only thing that spoiled the kit for me was the very heavy fuselage, and I recommend that anyone who orders the Garth 100" order it with an uncoloured fuselage. Mine weighs 65 Oz., but flies very well as long as there is a bit of wind (10 MPH+). I recently had a flight of 11 mins. 56 secs. on a dead flat airfield by the sea. The other photo is of myself with my Bird of Time after completing my flights in the first B.A.R.C.S. winter postal comps. Yes, we are crazy!

Garth 100", Sleek but relatively heavy sailplane.

Karen Harvey holding her dad's Garth 100" sailplane.

Mike Harvey displays great courage in flying his Bird of (Winter) Time.

"I have been flying the Bird of Time for 3 years. It is heavy at 66 ounces because it is covered in glass cloth (3/4 Oz.) over tissue, which makes it very strong and about the right weight for the normal British competition weather. I often have to put a POUND of ballast into it for our conditions. At last year's B.A.R.C.S. 'Radio Glide' ChampsI was flying at this weight and won two of my three slots but dived out badly on the third in very windy conditions."

(Thanks for the photos and interesting letter, Mike. It's always a real 'blast' to see how they other half lives! I was particularly interested to hear about the technique of covering over tissue with fiberglass. The other aspect that is of interest is the extremely sleek appearance of the fuselage mated to a constant-chord wing. Our readers may wish to write and ask you some more questions about the Garth...JHG.)

*****

MORE MAILBAG... New Hobby Store, SPLAPS, and more --

KEN MOORE, P.O. BOX 138, MILFORD, OHIO 45150 informed me that he is opening a new store called House of Hobbies located at 204 Main Street, in Milford. He's open for local business as well as mail order business, and would like to hear from RCSD readers.

In addition, he sent in a computer printout of the Selig 3021-095-84 airfoil (see pg 12, Bottom) which he plans to use on his new 100" Standard Class sailplane . Ken has also just finished what he terms a "super looking" 2-meter sailplane called SWEETHEART 2 that is patterned after the 100" ship, but uses an Eppler 193 instead of the Selig airfoil. He was surprised when he set it up to fly, because it was the first time he ever built a ship that needed NO extra nose weight! It balanced perfectly as set up with the radio installed.

Ken, we want to see pix of both sailplanes -- how about it?

******

BRIAN SMITH, 414 SILVER CREEK ROAD, WADSWORTH, OHIO 44281 has furnished some neat info about his latest attitude (and altitude) control system, describing it thus: "...I scratch-built a new wing with a Davey-type modified E193 airfoil using standard spoilers and SPLAPS. The spoilers are four bays long and standard size (approximately 1¼" wide...JHG). The SPLAPS (spoiler-flaps) are located on the bottom of the wing, halfway between the spar and the trailing edge. SPLAPS = spoiler - flaps, and you would have to see them work to believe it! They are 1¼" wide and 15" long, and I think that is their secret. Did you ever see a sailplane that you could slam on the brakes in mid-air, yet not stall, and still be fully controllable? You would be impressed!

" I run the spoilers and SPLAPS from two different servos, so I can have more control, but found I didn't need to, as the same amount of each is perfect. The plane flies super, and now I think I have found the secret to more landing points!

*****

MORE SOURCES JUST DISCOVERED.....Jerry Slates*

Many of you have written or called asking about sources for hardened steel wing rods (drill rod). I have found an excellent source for this material from: Blue Ridge Machinery and Tools, Inc.,P.O. Box 536, Hurricane, WV 25526. Showroom is at 2806 Putnam Avenue in Hurricane. Telephone is Toll-Free for out-of-state residents: (800) 872-6500 and for WVa residents it is ( ) 562-3538.

(Editor's Note: Jerry did not tell me whether he stocks this rod or not, but my assumption is that he may. Call him to find out.JHG)

The drill rod is available in water-hardened state inlengths of 12" and 36", and in diameters ranging from 1/16" to 19/32". Available also is shim stock, springwire, flat stock, etc.

* Jerry Slates, Viking Models USA, 2026 Spring Lake Drive, Martinez, CA 94553; Telephone: 9415) 689-0766

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WORK PROGRESSING ON THE SELIG AIRFOIL TESTS.....RCSD

RECENT INFORMATION from Michael Selig reveals that the tunnel has been completed and instrumentation is also nearly complete. The selected airfoils are being produced by volunteers, and more offers of help have been received than anticipated. As a result of this, some duplicate airfoils will be tested, possibly showing up differences in manufacture and/or building techniques. Testing is to begin as soon as a stock of airfoils has been received, and full results are expected by the end of August 1987. The tunnel data will be printed out by computer directly from the instrumentation itself, rather than through readings by a test engineer. Also, airfoil angle of attack can be computer controlled in desired increments fed to the test jig. Pressure distribution on upper and lower airfoil surfaces will be measured as angle of attack increases

AIRFOIL TESTS (Continued)...

to the stall, and as it decreases from the stall angle of attack, revealing hysteresis effects - a condition that shows airfoil behavior differences on the way up to stall and after recovery from stall. The exact nature of separation bubbles, how and when they form and disappear will be shown. It is expected that the recovered data will offer some exciting new revelations about airfoil performance and design at Low Reynolds Numbers, possibly paving the way for some entirely new 'foils of extremely advanced performance potential.

HOW TO LAMINATE YOUR CARBON FIBER TAPE.....Bart Como*

Laminated carbon fiber (CF) is coated with a thin layer of resin that gives it stiffness and makes it easy to cut into strips to reinforce wing spars, etc. CF "tape" is not laminated, but has its own applications on contoured surfaces. However, the disadvantage in using CF Tape is that the fibers usually separate when working with it unless they are taped down. (Note: Bart uses the term tape to mean Tow, i.e., strands of carbon fiber gathered in a unidirectional yarn - Ed.)

There is a very simple way to laminate CF Tape (or Tow-Ed.) so that the fibers will stay together and still maintain the flexibility needed to contour it to a structural area. Secure each end of the tape or tow to a piece of cardboard by means of a small strip of masking tape placed across each end of the selected length of tape. Next, place a piece of waxed paper underneath the CF between the secured ends. Make sure that the CF is stretched out flat and that the strands are as close together as possible. Now spray the CF with a few light coats of Aerosol Hair Spray. For added stiffness, use more coats. The laminated CF can now be cut into strips or any shape! One caution: Don't use this technique around open flame, as the aerosol spray is flammable!

(Ediors note: While it doesn't seem possible that this would work, it does, indeed, work beautifully. I have a sample strip here which I wish I could show you here. Also, the hair spray does not seem to bother the bonding process whether you use CA glue or Epoxy. Simple, neat & GREAT).

* Bart Como, 9918 Spruce Ridge Drive, Converse, TX 78109

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BENDING SHEET WOOD - AND OTHER TIPS.....E.G. Currington

If you dampen a sheet of wood to make it curl (usually by wetting one side only - Ed.) for sheeting a wing leading edge, e.g., be sure to let it dry before gluing. If it is still damp while the glue is setting up, it will shrink and tend to warp the structure.

TIPS (continued)

WOOD JOINERS -

From an old L.S.A.R.A. paper, author unknown, June 1945:

Number of times glued:	1	2	3	4	5
Relative Strength:	1.0	1.75	2.0	2.2	2.3

This relates to balsa and cement. Hardwood and Aliphatic resin will show the same trend, but a lower difference.

SCARF JOINTS -

Angle	90°*	60°	45°	30°	20°
Relative Strength	1.0	1.1	1.5	2.0	3.0

* Butt joint

The above is from the Montreal Area Thermal Soarers Newsletter, March 1987, editor E.G. Currington, 12 Caribou Crescent, Kirkland, Quebec Canada H9J 2H8

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SOURCES OF THINGS YOU MAY WANT OR NEED

Building boards -balsa: Paul K. Guillow, Inc., P.O. Box 229, Wakefield, MA 01880-0229; sizes 36"x14"x1" (WB2) or 48"x14" x1" (WB3) at just under $15 each, plus postage.

Building boards -cork faced: Country Hobby Supplies, R.R. #1, Dundas, Ontario, Canada L9H 5E1; 519-623-2560

Foam Wing Cores: Precision Cores, 850 Concord Street, Pleasanton, CA 94566; (415) 462-0672

Sagitta 900: Good news, folks; AIRTRONICS is going to produce this sailplane again, by popular demand, and dealers should begin receiving them by the time you read this. Also, CUMIC and CUMIC PLUS kits should also be available at the same time.

Computer Scoring: Edwin Wilson, 5308 Sprucewood Drive, Louisville, KY 40291. Software uses Lotus 123 on the IBM PC or compatible. Eight and ten-minute task - T2, and Triathalon task - T6. Sorting scores by class or overall scores; results & printout within one minute of last score turned in. Donation of $20 to Louisville R/C Club is all it costs. T-3, T-4, and T-5 to be added soon.

CLASSIFIED ADS - MORE GOODIES:

Clean out the Garage!!! Texas Novice needs intermediate ship. Has mastered basics with Gentle Lady and wants to move up. Call Michael Gwynn at (214) 522-5548 days, and (214) 931-9449 eves. I'll make a shipping box for you!

SCALE FOR SALE: Elliott Boulous, Box 430, Morgantown, PA 19543

GRUNAU BABY - pre-WWII German Intermediate Sailplane;
SG-38 - Pre-WWII German training glider;

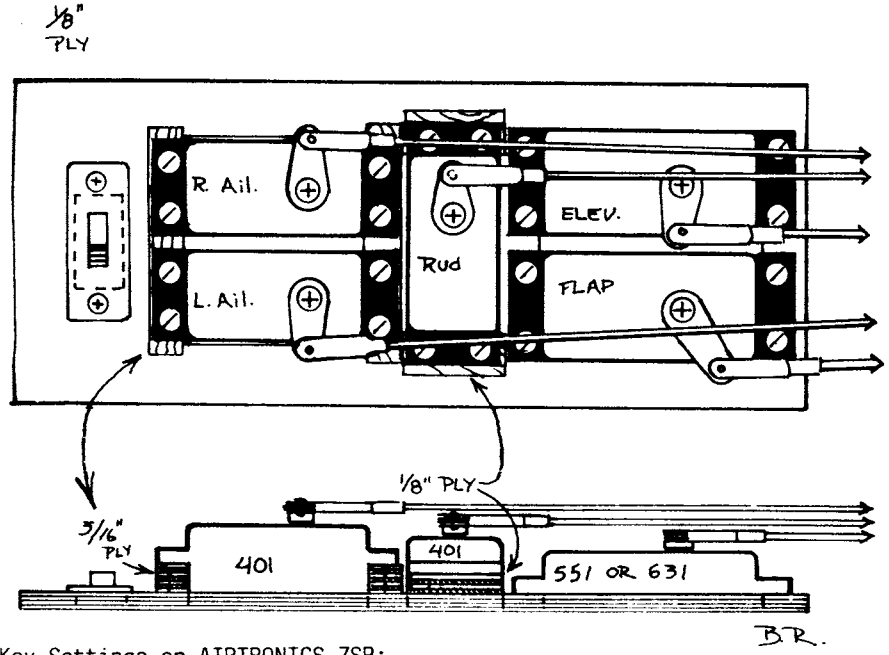
Both are covered, ready to fly or show. $200 each; 215-286-5129.

FULL ELECTRONIC MIXING FOR THE AIRTRONICS 7SP.....Jim Thomas*

This is the setup I use for my WINDSONG sailplane, including the servo tray arrangement, for anyone who may be interested. It is also applicable to ANY system having full electronic mixing capability.

Set up as below:

Flaps on throttle stick; flap trim on throttle trim
Aileron reflex is on the AUX proportional channel
Pre-set aileron reflex of 6° on the F_2-7E mixer switch
I don't use elevator pre-sets, but they can be used
Aileron/rudder is electronically mixed, but can be defeated for slope aerobatics, or whatever.



Key Settings on AIRTRONICS 7SP:

Aileron differential - full
Flap/spoiler select - spoiler
Flaperon/sapoileron - Flaperon
Pulse mixer - 2-6
Aileron/rudder mix - Full
Spoiler/elevator mix - Full

Flap trim & flap 2 - customize for (1) neutral aileron, and (2) reflex 6° aileron

* James A. Thomas
740 College Avenue
Holland, MI 49423

WHAT'S NEW IN SOARING? .....RCSD

I'd like to call your attention to a new advertiser: AMERICAN SAILPLANE DESIGNS (see ad elsewhere in this issue). This firm is the brainchild of Gerry Anderson of San Diego.

It is Gerry's belief that there are dozens of excellent sailplane designs out there which have never received the popularity or acclaim that they should have...due primarily to the inability of individuals to adequately promote their designs.

We've all seen the Europeans come forth with dozens of exotic and interesting sailplanes, while the U.S. has developed and advertised considerably fewer, and it's Gerry's idea that we do have fully as many excellent potentially SUPER SAILPLANES right here in our own backyard. Therefore, he is inviting any of us who have glider designs, kit plans, or related supplies for soaring, to contact him for nation-wide marketing and promotion. Sounds like a good idea to me, so why not give Gerry an opportunity to show you what he has in mind for YOUR PET SAILPLANE DESIGN?

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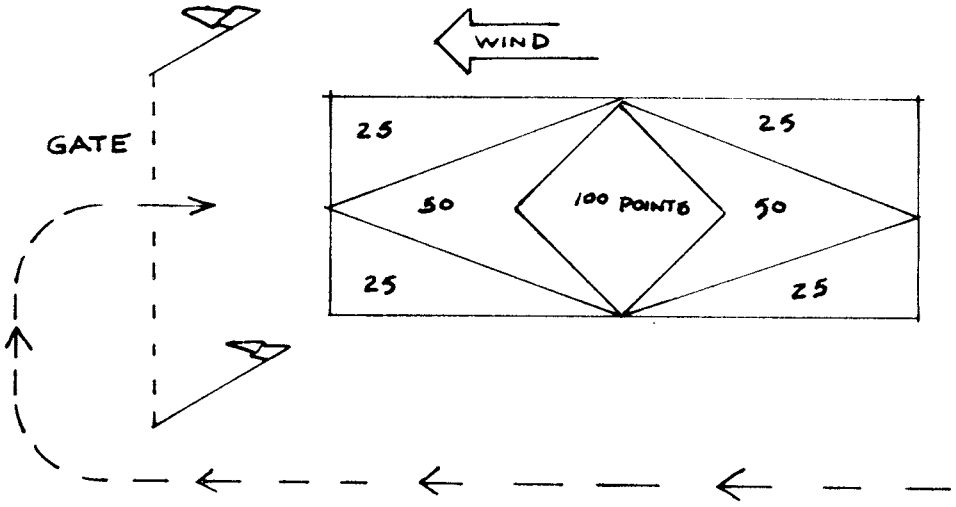


ANOTHER WAY TO JUDGE LANDING POINTS.....Jerry Slates

One of the things we do out here (California) is to add to the scale landings. A landing judge is required -- just like the real thing. Extra points are given for proper execution of down-wind, base, and final legs of the approach, with 90-degree turns. Landing points are given depending where the nose of the glider stops on the runway (see sketch). Rolling or sliding off the end or out of the sides of the landing box results in zero landing points; and a flip-over or loss of parts also results in zero landing points.

REVIEW: JOE BRIDI'S "KASTAWAY" HAND-LAUNCHED SAILPLANE....Tony Beckett*

Some of you will recall the FLIPPER by Bridi Aircraft Designs, 23625 Pineforest Lane, Harbor City, CA 90710. Now here's the sequel to that design as reported by our English correspondent, Tony Beckett.

Wing Span: 59 inches — Airfoil: Modified Eppler 205

Wing area: 380 Sq. In. — Flying Weight: 15 Ounces

Length; 35½ Inches

"The instruction leaflet arrived before the kit, and I had a high old time trying to visualize how KASTAWAY looked from the building hints. I discovered the wings had spruce spars with plywood shear webs, and - instead of a 'D'-box - there was a third, balsa 'turbulator' spar. The fuselage was 3/32" balsa sheet, and the fin the same.

"What the leaflet didn't tell me was that the balsa was good quality and the correct weight for its job; that the rib die-cutting was excellent - so good, in fact, that at first I didn't think there was any die cutting at all - the lines were so fine. However, each rib with a bit of wiggling came out perfectly.

" Another thing I wasn't prepared for by the building hints was the actual appearance: fairly low aspect ratio, polyhedral wings with considerable sweepback on the tips. This style can make a small model look ungainly, but Joe Bridi has chosen a large, low, rounded fin and rudder shape which complements the wings well.

"No problems with the building; things slotted together nicely. The wings have interesting horizontal 1/8" ply dihedral braces. I've not seen a brace designed like this before. The ply shear webs were supplied cut to height, and when cutting each to correct length it's worth remembering that the ply snaps cleanly if you score it well...saving blunting your total stock of knife blades. There are no caps to the wing ribs, but each rib has a gusset to strengthen the joint with the trailing edge. I got the feeling, compared with a 'D'-box wing, that the uncovered structure was not quite so stiff.

" The sheet fin and tailplane could have lightening holes cut from them, and this I did. The wing fixing was by dowel peg at the leading edge and self-tapping screw at the trailing edge. There was well thought-out use of ply in the fuselage, with provision for towhook and details of a 'finger hole' for maximum-effort hand launches.

"There is room for standard-sized servos in the fuselage, but miniature ones were suggested, so they were fitted with space to spare under the wing. I could well change to larger servos later and check the difference in performance, if any. The standard two-channel receiver was a tight fit in the nose area. A 250 mA, Nicad battery plus an ounce of ballast gave the correct c.g. position and made the flying weight 15 ounces, as suggested on the plan. A miniature jack plug and socket provided the switch.

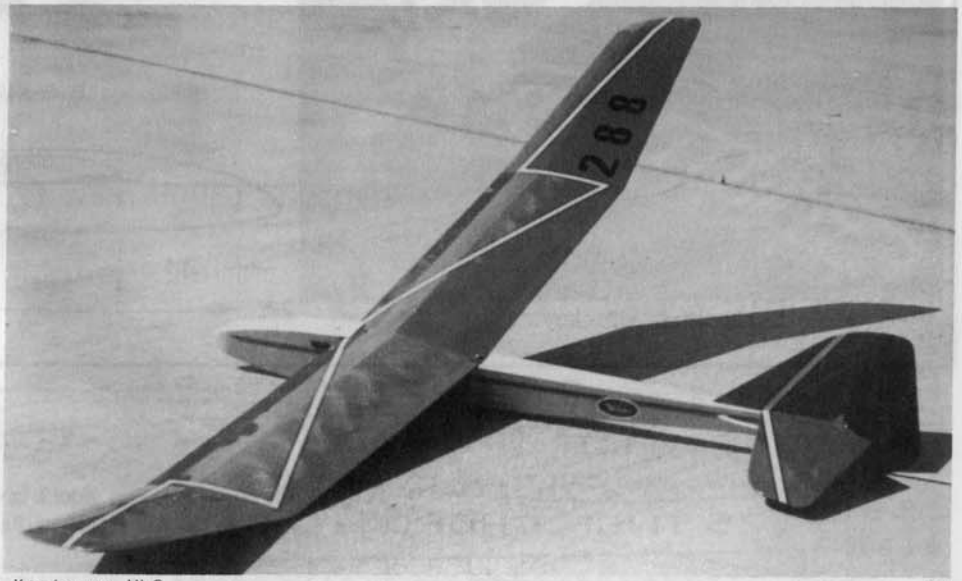
"The instructions suggested 'snakes' for the control runs (cables) and our local hobby shop had some nice all-plastic snakes with which #20 swg makes a nice sliding fit inside the inner plastic piece. Set up this way, the snake size is in keeping with the model, and careful bending of the 20 swg wire allows the wire to be connected at both ends without a clevis.

"KASTAWAY was covered with tissue - heavy weight on the wings and light weight on the fuselage and tail. Heavy-weight tissue goes on best wet, and you can do this by allowing the tissue to float on the surface of a bowl filled with water and then dragging the tissue over the edge to remove excess water. The tissue is then stuck to the model surface with dope and - in the awkward places - with balsa cement. The covering and water shrinking are done in one session, followed by two coats of dope for final shrinking and weather-proofing at a later session. The hinges were done with Magictape.

"In deference to the middle-aged with weak arms, a standard chuckie-sized bungee has evolved in the U.K. This is 5 meters of rubber with 15 meters of line. To try to keep all bungee (hi start) launches at about the height of a reasonable throw, we include a 10-meter 'stop' on the rubber to prevent it being stretched more than twice its own length. A setup like this provides a good, fast launch that is far more consistent and higher than I can produce with my arm.

"For once the weather was reasonable for testing. First hand launches showed the trims and balance were okay; then off to the side of the valley. This slope won't keep my aerobatic models up unless there is a good blow, and then it is so turbulent that it is unpleasant to fly. However, in the 5mph drift the Kastaway was up and away with no trouble. Ten minutes of gentle floating about showed the model was responsive, could be turned easily, and looped tightly. Then off to the flat field for bungee trials. A good, fast and straight launch was possible, as well as tight, flat turns. The cold March weather was not providing any lift, and average flight times were around the 30-seconds mark. You would need good technique and a strong arm to equal that without a bungee.

"Overall, Kastaway comes out well as a kitted m odel with a distinctive appearance. The size and weight put it at the top of end of the HLG category (in England). It is ideal in light winds on poor slopes, and bungees well. I'm now after some thermals to see how it reacts to those.



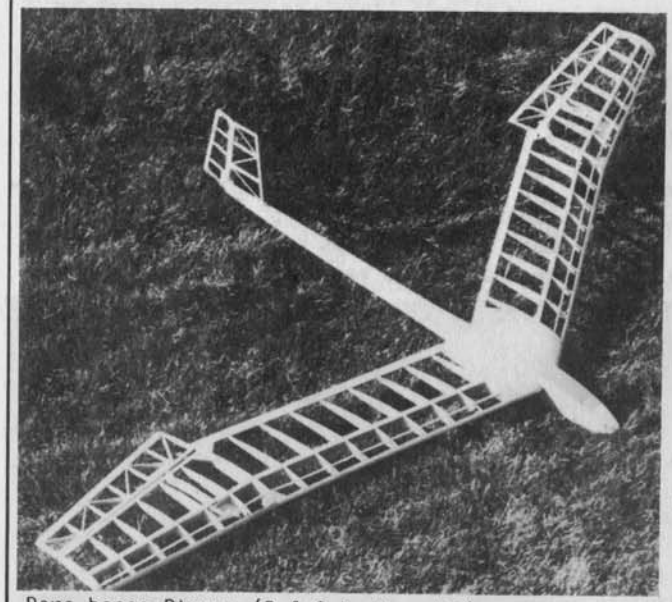
Kastaway HLG

PTAERO (DACTYL)

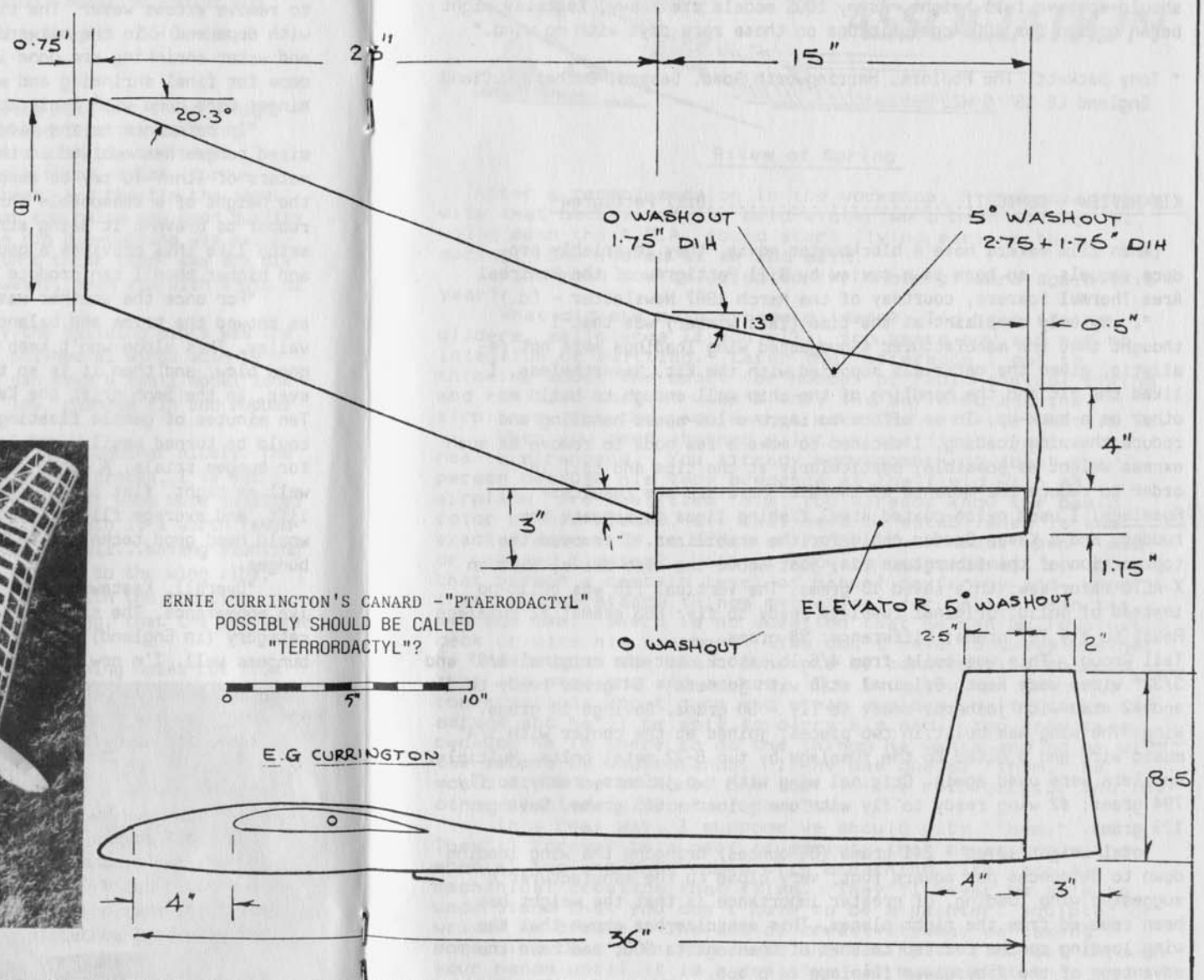
AIRFOIL - CLARK Y

AREA*	= 548 IN²
SPAN	= 78.5 IN
ASPECT RATIO*	= 11.24
MAC $\bar{c}$*	= 7.26
.25 $\bar{c}$*	= 7.66 AFT OF ROOT LE

*LESS ELEVATOR PORTION



Bare bones Ptaero (R.C.S.D. Nov.'86)
How does it fly,Ernie ???

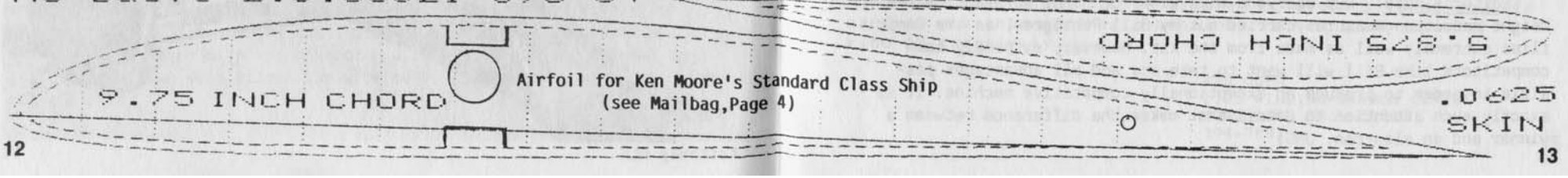


ERNIE CURRINGTON'S CANARD -"PTAERODACTYL"
POSSIBLY SHOULD BE CALLED
"TERRORDACTYL"?

0 5" 10"

E.G CURRINGTON

MS Basic 2.0:S3021-095-84



Airfoil for Ken Moore's Standard Class Ship
(see Mailbag,Page 4)

Kastaway Review (Continued)...

If 30 seconds from 15 meters is accurate, it should have a still-air time of 5 minutes from a 150-meter towline. Using a light line, Kastaway should achieve full height. As my 100S models are heavy, Kastaway might be an option for 100S competitions on those rare days with no wind."

* Tony Beckett, The Poplars, Harringworth Road, Seaton, Oakham, Rutland England LE 15 9 HZ.

KIT REVIEW - CUMIC II.....Bill Pettigrew*

(When film makers have a blockbuster movie, they invariably produce sequels - so here is a review by Bill Pettigrew of the Montreal Area Thermal Soarers, courtesy of the March 1987 Newsletter - Ed.)

"...My only complaint at the time (last winter) was that I thought that the manufacturer's-suggested wing loadings were not realistic, given the materials supplied with the kit. Nevertheless, I liked the kit and the handling of the ship well enough to build another as a back-up. In an effort to improve low-speed handling and reduce the wing loading, I decided to make a few mods to remove as much excess weight as possible, particularly at the tips and tail in order to reduce the moments of inertia. Here are the results:-

Fuselage: I used nylon-coated steel fishing lines to actuate the rudder, and a Kavan Bowden cable for the stabilizer. I removed the top portion of the fiberglass fin, just above the stab drive, with an X-ACTO razor saw; this saved 13 grams. The vertical fin was built-up instead of solid. Original fuselage ready to fly: 865 grams; #2 Fuselage Ready to fly 767 grams; Difference: 98 grams.

Tail Group: This was built from 4/6-lb. stock, but the original 1/8" and 3/32" wires were kept. Original stab with joiners - 64 grams ready to fly and #2 stab with joiners, ready to fly - 50 grams. Savings 14 grams.

Wing: The wing was built in two pieces, joined at the center with 1/4" music wire and b olted to the fuselage by two 6-32 metal bolts. Multiplex spoilers were used again. Original wing with two joiners, ready to fly - 794 grams; #2 wing ready to fly with one joiner - 665 grams. Savings: 129 grams.

Total weight saved = 241 grams (8½ ounces) bringing the wing loading down to 8½ ounces per square foot; very close to the manufacturer's suggested wing loading. Of greater importance is that the weight has been removed from the right places. This exercize has shown that the wing loading can be reduced to that of the Sagitta 900, and have the advantage of the fiberglass fuselage to b oot.

(Editor's note: Not everyone will want, or need, to practice the weight-reduction measures carried out by Bill Pettigrew, as the Cumic flies extremely well as made from the kit. However, extremely keen competitors like Bill will want to take any and all advantages possible in order to produce an exceptionally competitive machine. It is exactly such attention to detail that makes the difference between a winner and an also-ran. JHG)

Rites of Spring

After a recent session in the workshop, I commented to my wife that because of the mild winter we'd been having, it would mean the A.S.A. could start flying earlier this spring. She looked at me and said,

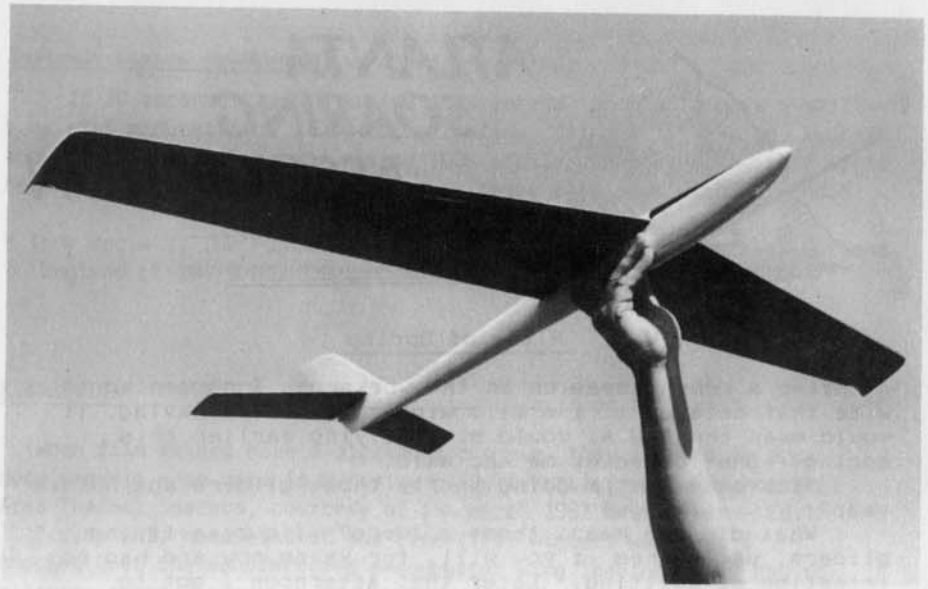
"You mean you"re going to fly those gliders again this year?"

What did she mean, those gliders? I'd been flying gliders, sailplanes if you will, for years now and had no intention of quitting. Later that afternoon I got to thinking about the sport (or hobby) of radio control flying and realized that it wasn't only the building and the airplanes, but the people that make the activity what it is.

When you meet another pilot at the field, you're not really strangers. You already know something about the person because his very presence at the field with an airplane "pre-qualifies" him. You already know the basic color of his dreams, all that need be established is the exact flavor. Is it scale or F-3B? Full house open class or weekend floater? Without knowing consciously, you grant that person a certain level of manual dexterity and know that he understands things mechanical far better than the average man. There is no question that he can build a patio deck or wire his basement. You don't have to guess whether he understands the basic concepts of constructing objects that are straight and square. You know you can get into conversations about cars and steam engines, half-tracks and servos and he'll be able to carry his end. You know this because he is there to do the things he wants and to be with the people he understands. If he was one of "them," he would still be at home, one foot in the refrigerator and the other planted in front of the T.V.

In a real way, I suppose we should pity "them." They'll forever be a part of society that never knows the special feeling that comes with breathing life into a mechanical creation that flies. They'll never be able to understand that you don't have to be a painter, sculptor or writer to create. The act of creativity may be taking something that's in your head and making it flow out through your hands until it is a reality. It makes little difference whether the object is a book shelf or an ASW-17 but, when the object you've created or given a lease on life carries you into another dimension, it's a truly special kind of creativity.

KEN ODEN
1325 WINDING BRANCH CIRCLE
DUNWOODY, GA. 30338
394-7891



SOS 50"

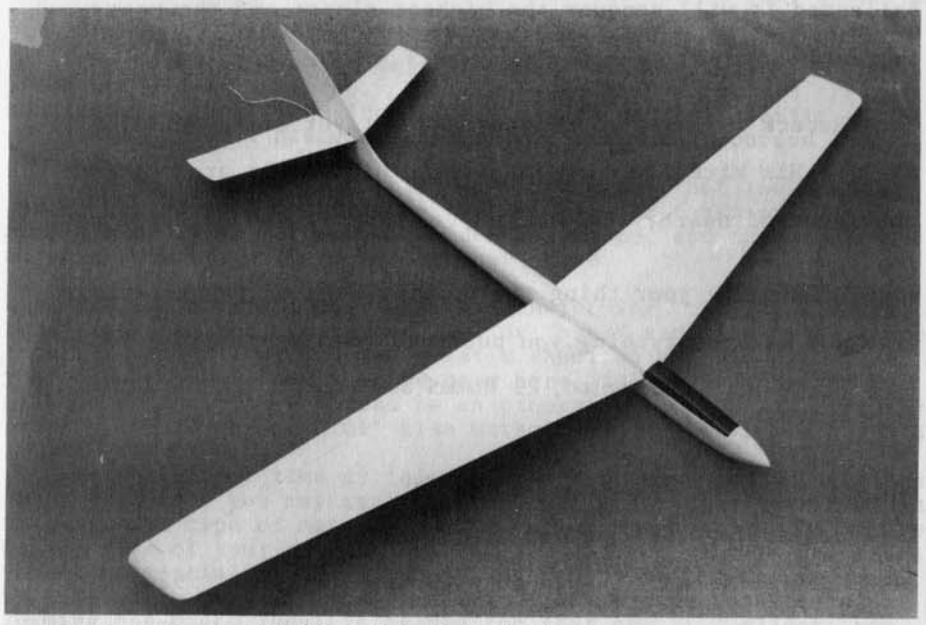
THE SONS OF SAVAGE

Text and Photos by John Benson*

The Savage sailplane, by California Slope Designs, is an aerobatic model with a large, semi-symmetrical wing slightly swept back and rather strongly tapered. The fuselage is built of balsa with full length doublers of thin plywood, the wing is balsa sheeted foam and the stabilator is strongly built up and covered. Usually set up with elevator and aileron control only the model is light, sleek looking, highly maneuverable and quite fast.

CA Slope Designs is the brainchild of a young Californian named Mark Rebeck who runs the business in a relaxed, low-pressure style. After producing the Savage for a while he brought out a miniature version of the same design with the wingspan scaled down to a mere 42". Once again light construction was featured. Carefully built and with small radio gear the "Son of Savage" tipped the scales at less than twelve ounces. Almost at once its polysyllabic name proved too long for convenience and was abbreviated to SOS.

With its short moment arms and long servo throws the SOS is a real handful the first few times out. The initial reaction is that shorter throws or dual rate would be a help but they are, in truth, a hinderance. This model must be flown fast. Hair trigger responses from the sticks (and from the pilot) are a must. Like most taper wings the plane has an abrupt stall; what keeps it flying is a nose-down attitude and a series of brisk, rapidly executed turns. With a bit of practice this style of flying becomes familiar and as it does the stall disappears. Many people, however, feel that the SOS 42 puts a bit of a strain on middle-aged reflexes.



John Benson's SOS 50" (Mark Rabeck Design).

In an effort to compromise, a scaled up SOS was brought out with a stretched fuselage and a longer wing. Root and tip chords are the same as on the 42 (7¼" root, 3 3/4" tip) but the span is pulled out to 60". This version takes larger radio gear, flys more calmly and still maintains much of the agility of the smaller model.

Not long ago a third version was put into production, still using the same root and tip chords but with a span this time of 50". Weighing in at around 15oz this Son of Savage may well be the brightest member of the family.

Like its brothers it turns and rolls with dazzling speed. Inverted performance is excellent and a broad range of maneuvers can be accomplished in a remarkably limited space. With its light loading it will fly happily from the smallest of slopes. In laminar air we have flown the 50 from low sand dunes, small levees and even a six foot high concrete seawall. Ballasted it will conquer the highest slopes and the most impressive gales.

Mark Rebeck is a superb builder and a flyer of astonishing skill. His kits are quite basic and his models are not for the faint of heart. But if you've got a taste for action and slope flying is your thing the amazing Sons of Savage will give you back everything you put into them and a whole lot more besides. John Benson, 29 Thames Street, Newport, RI 02840

The SOS 42 . The SOS 50 . The SOS 60

California Slope Designs

31932 Calle Winona San Juan Capistrano, CA 92675

SLOPE SCENE

PRACTICAL VACUUM FORMING FOR THE HOME SHOP MODEL MAKER

(Part One of Three Parts)

By Harry Finch

What we will be describing in this series of articles is a practical, inexpensive vacuum forming machine and related tooling which will allow the home modeler to form a wide range of plastic parts, ranging from small bubble canopies to full-size fuselages. The basic method and vacuum source which we will use is already used by some big plastic sign companies to form huge sign faces from 1/4" plastic sheet.

Believe it or not, the vacuum source is a vacuum cleaner motor! That's right, folks -- just like the one in your shop vac; more about this later.

The use of plastic materials in model making is commonplace and widely accepted. Many **thermoplastic** materials are available in sheet form from your local industrial plastic supplier. We will discuss types of materials and sources later.

The key word is **thermoplastic** which means that the material can be heated to a temperature well within the range of your home baking oven, forced into a desired shape, and then cooled... at which time it will retain the new shape.

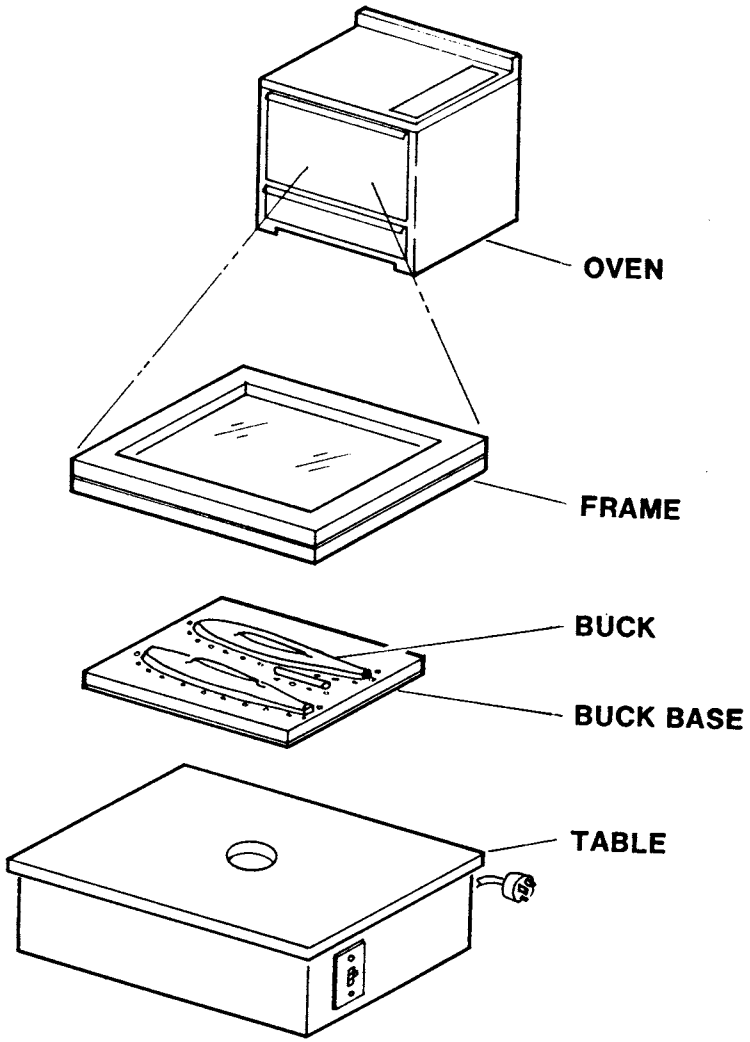
The basic setup involves a vacuum-forming "table", a "buck base" to which you attach the tool or "buck" and finally a "frame" to which you will attach the plastic sheet so you can put it in your oven to heat it. What we have here, folks, is a very simplistic approach to what can be an otherwise complex and expensive process. Yes, the good ol' kiss method: "Keep It Simple, Stupid!"

Take a bit of time at this point and do some serious thinking about the parts you may want to form. This question involves size of parts and type of material. The matter of part size is limited by the size of your oven and table. Unless you want to construct your own special oven, which may not be too difficult, you will be limited to parts of moderate size. If you are thinking of forming one-piece fuselage halves for that new "XL" glider, you had better plan on making your own oven. We can all make hundreds of parts within the size range of our home ovens, so don't be put off by the size question.

Let's now go through the construction of the vacuum table which is the heart of our system. It is very simple, but a couple of things are **very i m p o r t a n t**: a strong vacuum motor, a very flat, smooth table surface, and complete enclosure of all electrical wiring.

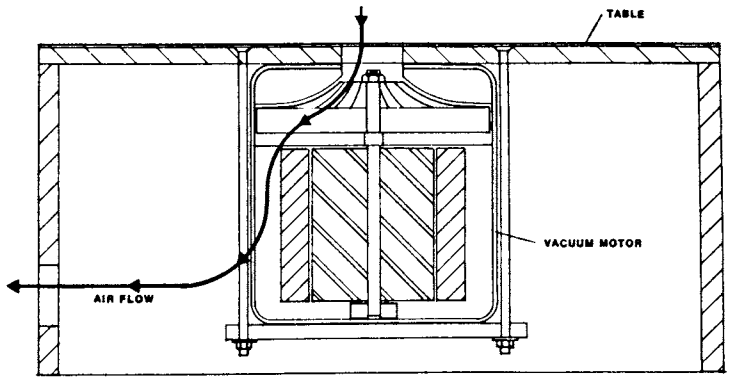
You should be able to find an old vacuum cleaner motor; go to garage sales, the "good will" stores, etc. -- even auctions -- until you can find a good used heavy-duty one. Look at the spe-

cification plate and locate the motor amperage... which should be at least 8 amps. The higher the amperage rating the better.



COMPONENTS OF THE BASIC VACUUM FORMING MACHINE

(Refer to page one of this series of articles for consideration of table size, which must be at least six inches longer than the longest part you want to form.) A length and width of about 30" by 18" should be about m i n i m u m . I suggest that you find a piece of Formica-covered counter top material. Many lumber yards have sink cut-outs which are perfect for your purpose and can be obtained at a very reasonable price (like free). You will also need an appropriate ON-OFF switch and wall plug. Be sure that the switch has a rating which meets or exceeds the motor amperage, and has a full enclosure for electrical safety.



SECTION THRU VACUUM TABLE

The assembly of vacuum motor and table are critical. Measure the diameter of the venturi on the motor and bore a hole of equal diameter in the center of your table material. This hole will be about 1 1/2" or 2" in diameter. What we want to do is mount the motor venturi as directly and closely as possible to the bottom of the table center hole. By keeping this connection close and absolutely air-tight, you will insure that the vacuum applied to the bottom of the tooling will be maximum.

When you're looking for your motor, keep in mind that there are many different configurations of motors available, and that you will want to mount the suction end of the motor to the flat underside of the table.

In some instances, you may have to fashion an adapter collar to the motor and table to effect a proper seal. In ALL cases be sure to make a gasket and/or use Permatex or R.T.V. silicone (bathtub caulk) to seal the motor to the table. Bolt the motor to the bottom of the table with suitable hardware. The accompanying drawing shows air-flow arrows, so be sure to bore several airflow holes, each equal to the venturi diameter. You do not want to create any pressure under the table.

Next month, we will work on the "frame" which supports the plastic during heating and forming, and the "buck" which is the changeable tooling used for forming various parts.

THE RACES

The Third Annual Hans Weiss Memorial slope race was held on March 22, 1987 at the Hughes Hill site in the Inglewood, Playa del Rey area of Los Angeles,

Fast and furious fun. Many mid airs including one between Mike Bame and Joe Wurts in the final fly off. Wind conditions were strong for this site in the 20 M.P.H. range which yielded a fastest lap time speed of 43.1 M.P.H.

Final results: 1st - Mike Bame ; 2nd - Joe Wurts; 3rd - Steve Drake; 4th - T. J. Moran; and 5th - Casey Goeller.

Slope Scene (continued)

The Second Annual La Sierra slope race was held in Riverside, California on April 10th, 1987.

This race we held under very heavy wind conditions, wind velocity varied from 22 M.P.H. to 30 M.P.H.

Here again, lots of mid airs and crashes due to gusts, turbulence and pilot errors of course. This race is divided into two classes, rudder elevator, and aileron.

Maybe they will change the name of this race to the "Bill Bennett Challenge Cup." Bill won a first place in aileron last year and both classes this year.

Final Results: Rudder elevator -- 1st - Bill Bennett; 2nd - Steve Martin; 3rd - Harvey Jenkins; 4th - Ron Black; and Leroy Boucher. Aileron -- 1st - Bill Bennett; 2nd - Carl Lindou; 3rd - Mike King; 4th - Dale Widmer; and 5th - Bob Bober.

Harry Finch, 1150 N. Armando St. Anaheim, CA 92806

FURTHER INFORMATION ABOUT MY WINGERON PRODIGY.....Ty Sawyer *

In the April issue of RCSD, I described my experiences with the PRODIGY but since writing that article some additional thoughts have come to mind that may help you when you build your own PRODIGY.

The only problem I have had is that I have broken the tail boom three times on rough landings. The first two resulted from landing too fast and catching a wingtip - slewing the fuselage around at about 90° to the line of flight. The side load of the tail surfaces twists the boom, causing it to break. The third time I was flying over miniscule sandbank when I bellied out on the snow crust following pull-out from a stall turn. All of the repairs were easily made, and the broken ends of the boom fit back together without difficulty. The repairs were done by zapping the pieces together and sanding 3 to 4 inches either side of the break to relieve the surface a little and to minimize the visibility of the repair. A thin coat of epoxy was then brushed on to the fuselage sides and a double layer of carbon fiber tow was layed up spanning the break on the sides of the fuselage. Just enough resin to wet out the carbon was worked into the layup, and then a layer of 1½-oz. glass cloth was wrapped around the fuselage and worked into any resin remaining in the carbon repair area. More epoxy was worked into any dry areas remaining. If done properly, there will be no excess resin (hence extra weight). Strive for NO runs in the resin, and no resin-starved areas in the cloth. After cure, the glass is sanded and filled with a light-weight filler. At this point the fuselage is covered with a layer of carbon and glass cloth beginning a few inches in front of the trailing edge of the wing and ending at the tail. The repaired fuselage is stronger than the original, and the weight penalty was only 3 ounces, including the balance weight in the nose.

Paul Carlosn said that he hadn't heard about fuselage breaks being a problem, but - as a standard procedure - he glasses most of the fuselages he builds. For those of you who like to take the easy way out, or like to scratch-build, OFF THE GROUND MODELS offers a Fiberglass fuselage for the PRODIGY, and it costs $37.95 direct. It is made by Bob Sealy, so you know that the quality is first-class. I have received mine, and I must say that it is a fine piece of work. The fuselage comes with a basic set of hardware, and Paul says that he will sell plans. Pushrod housings are installed as received, but you must install the bulkheadsa -- altho I am not sure it needs them. Paul says that the finished fiberglass fuselage weighs 2 ounces less than the wood fuselage when finished. I expect to see some foam wing cores for the PRODIGY soon, or you can cut your own using your favorite airfoil...and, yes, my new PRODIGY will be built with wingerons!

* Tyson Sawyer, Silver Ranch Airpark, Jaffrey, N.H. 03452; (603)532-8870

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