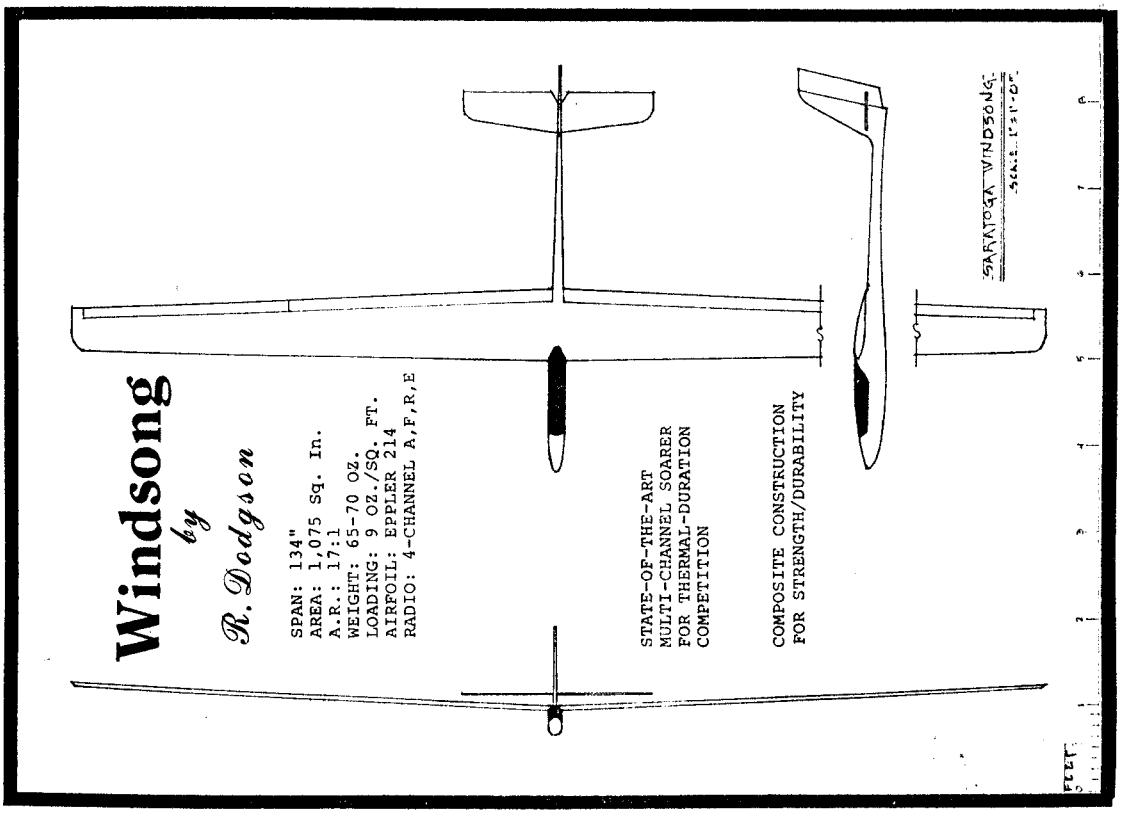
RC Soaring Digest

APRIL 1984

VOL. 1 NO. 4



FLYSWAPPER

CLASSIFIED ADVERTISING:

RC Soaring Digest will take classified advertising from both individuals and from businesses. The INDIVIDUAL RATE will be 10¢ per word; the BUSINESS RATE will be 25¢ per word. Addresses free. Count only the words in the main ad. Copy must be typewritten and prepayment by check is required. Please submit all advertising copy before the second week of the prior month. For example, February issue ads must be in before January 15th. Checks payable to RCSD.

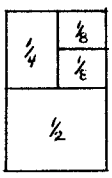
DISPLAY ADVERTISING:

RC Soaring Digest will take display advertising. The rate will depend upon the number of issues in which your ad is to appear, and the following schedule is based on frequency of appearance in RCSD. We suggest, to start, that all ads be typeset and ready for camera.

Ad sizes and formats are as shown in the table below, with the requested dimensions and formats. Full-page, half-page, quarter-page, and eighth-page sizes are available.

Note: All ads, classified or display, will be half price to all clubs and not-for-profit organizations. Ads received too late for publication in the desired issue will be held for the subsequent issue, unless requested otherwise by the advertiser. Publisher takes no responsibility for the accuracy, truthfulness, or credibility of offered merchandise. Any ad repugnant to common sensibility may be turned down by the publisher as unsuitable.

1 issue	3 issues	6 issues	9 issues	12 issues	Sz.
$10	$9	$8	$7	$6	1/8
$20	$18	$16	$14	$12	1/4
$40	$36	$32	$28	$24	1/2
$80	$72	$64	$56	$48	1



Note: Dimensions of ads - 1/8th page - 1/4th-page - 1/2-page

Full: 12"H x 7"W 3"H x 3.5"W 6"H x 3.5"W 6"H x 7"W

RC Soaring Digest
P.O. Box 1864
Peterborough, N.H.
03458

HI START

This month's cover features the new Dodgson Design's Saratoga WINDSONG, a multi-channel sailplane for out-and-out thermal duration and competition flying. It was a 'hit' at the 1983 Nats, and many fliers went away from there vowing to order a kit.

WINDSONG features what has been called 'taco shell' construction, meaning that the fuselage has an open top to make installation of controls and radio equipment very easy. Then, a balsa and fiberglass top, or turtledeck is formed over the bottom portion, making a clean, smooth, one-piece unit.

Fuselage length is 52 inches (less rudder) and width is 2½" maximum. Wing construction is foam core, spruce spar, and 1/16" balsa sheeting. Control mixers feature the aileron-spoiler function in which flaps go down and ailerons reflex up to provide a lot of drag at the trailing edge, plus a flap-elevator compensator that takes out the sudden pitch-up common to application of flaps.

High-speed flight is possible with a negative, or reflex, flap position of 6 degrees when a high cross-country cruising speed is needed, or when you have to come home from a long downwind flight. The flaps can go down 80 degrees, and the ailerons can come up 35 degrees for absolute heart-stopping spot landings. These are also able to be coupled or un-coupled for extraordinary combinations of geometry control.

The high-aspect ratio wing helps on sink rate and flat glides where Dodgson's tests have shown that it can get up to 25% more "dead air" time than conventional 'floater' sailplanes. The ship is extremely clean; i.e., low-drag.

Bob Dodgson, the designer of WINDSONG, claims that this is his best design to date in terms of being easy to fly well, and in extracting outstanding performance. Although he doesn't claim it as a multi-task ship, it would seem quite well suited to both duration and distance tasks...giving up only a little to out-and-out F3B types in the speed runs.

For more information, you might consider writing for the specs and brochure. Dodgson Designs, 2904 SW Camano Drive, Camano Island, Washington 98292.

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The annual WRAM show, mentioned in last month's Hi Start is now history. RC Soaring Digest, exhibiting for the first time, shared a booth with Ted Davey's Davey Systems Corporation. I was somewhat disappointed by the lack of new sailplanes at the show, and noted that almost all of last year's designs were there again. However, I did see a SON OF SAVAGE by California Slope Designs at the NOVAX booth, and a beautiful static-judging contest entry ALPINA, which is tres formidable! Avionix showed a catalog of Aviomodelli ships soon to arrive in the U.S. These will include all-fiberglass jobs. Your newsletter commanded quite a bit of attention, and it was FUN to meet and talk with old friends and new, many of whom I had never met before but had corresponded with for years. Our subscriptions now number well over 200, with more coming in every day...and that is with only half of the mailing list covered as yet. I hope to have 500 subscribers by June, and as many as 1,000 by Christmas! You'll note that we are taking advertising, too. Hope you like it. From the comments received so far, both by mail and at the show, it seems that we're right 'on target' as far as most of you are concerned. It begins to look as if articles of moderately technical content are favored, with an emphasis on 'how-to' material. The article on shell-wing construction in the March issue has been very well received.

Just remember that this is YOUR newsletter, and I'm bending every effort to make sure you are pleased and happy with its content and regular appearance. If you don't like it, just let me know and I'll refund the unexpired portion of your subscription. GUARANTEED!

Happy Soaring,

Jim Gray
Editor and Publisher

KIT REVIEW OF SARATOGA WINDSONG... ... Bob Sealy*

During the last three months, I have had the opportunity to build four Saratoga WINDSONGS. Three were for fellow club members and one was for myself. Several variations or deviations from the plans were tried on some of the models.

FUSELAGE

The materials used in building the fuselage are a combination of fiberglass, lite-ply, balsa, and spruce. The end result is what I consider to be and extremely good weight-to-strength fuselage. However, there is one catch to this type of construction: it is not the easiest to build. It takes, time, patience, and careful attention to alignment. This is not to say that it is impossible, but only that it requires more attention than you might be accustomed to.

A few areas to be considered include alignment of the wing joiner tube. Pay careful attention to get it perpendicular to the fuselage center line, and be sure that the wings will be flush with the top of the fuselage. This may require lowering the brass tube about 1/32" lower than the alignment marks shown on the fuselage.

When fiberglassing the rear balsa deck, do not hesitate to use enough resin. All four WINDSONGS that I built came out nose-heavy by about 1/2 ounce. A rearward shift of the 1200-mAH battery pack solved this.

Bonding parts to the fiberglass is easy if you allow yourself enough time for the resin to cure. I used polyester resin, clamped the parts securely, and allowed them to dry for 24 hours. This procedure required about five days just to bond all of the parts to the fiberglass, but - remember - there are a number of other things to work on in the meantime.

One final note on the fuselage is the fuselage-to-canopy fit. When gluing the servo tray in place, make sure you pull the sides together enough so that the fiberglass canopy rests in the molded recess of the fuselage, and that it is flush with the fuselage sides; otherwise, the fuselage is just a bit too wide, and the canopy will not fit flush with the fuselage sides.

I personally think that the WINDSONG fuselage is the lightest and strongest fuselage that I have built to date. It is one of the few designs that does not require a half-pound of lead in the nose to achieve a proper center of gravity.

WINGS

This was my first encounter with foam wings. Assembly time was much faster than I had estimated. Except for a few variations of spar design, I built the wings as per the plans. The original spar length of 24 inches has now been increased to 32 inches. This still appears a bit short.

On one set of wings I installed pre-impregnated carbon fiber, manufactured by Twinn K, between the foam and the balsa sheeting on both top and bottom of the wing. The 1/2-inch-wide carbon fibers overlapped the spruce spar by two inches and extended out to the tip of the wing. This resulted in a much stronger wing, with an increase of only 1/4 ounce.

On another set of wings, I ran spruce spars along the entire span, top and bottom, with shear webs in the first 32 inches only. These wings were about 2 ounces heavier than a standard set of wings, but the end result was well worth the 2-ounce penalty.

Supporting the assembled model on one wingtip, and holding the opposing tip about 4 feet in the air, allows you to see the flexing of the various spar configurations. With the standard 32-inch spar setup, there appears to be a considerable amount of wing flexing. I am sure that this setup will work fine for most pilots, however.

With the carbon fiber extensions, flexing was cut in half. I would recommend this alternative to anyone who plans to put their WINDSONG through excessive G-forces, aerobatics, limited slope soaring, and extensive thermal competition.

The third alternative of full-span spruce spars, top and bottom, resulted in virtually no (visible) flexing at all. This spar setup would work fine for limited zoom launches and for individuals planning to do an excessive amount of slope soaring.

A few other areas of wing construction that deserve mentioning are the spar fillers and wing-to-fuselage fit. Dodgson supplies a sandable balsa cap that attaches to the top of the spruce spar and allows the balsa cap to be contoured to the top of the wing. I used Red Devil "One Time Spackling" instead of the balsa cap, finding it easier to sand and very easy to contour.

WINDSONG KIT REVIEW CONTINUED...

Fitting the wing to the fuselage can be very frustrating at times. One method that I found that works well for me is to sand the root of the wing to the best of your ability. Next take the plywood root rib and attach it to the fuselage using transfer tape. Next, apply epoxy to the wing root, install the wing joiner, and slide the wing up against the plywood root rib. It is preferable to do both wings at the same time. After the epoxy sets, use an epoxy-microballoon mixture to fill in any areas between the plywood root ribs and the wing roots that did not get bonded the first time. This method will provide a gap-free joint between the wings and the fuselage.

FLYING

I am sure that most of you have seen at least one WINDSONG in flight over the last two years. My first impressions were that this was one nice-handling sailplane: smooth on controls, responsive in turns. It launches better than any sailplane I have seen, and - under the thumbs of a competent pilot - it has the capability to take you to the top of the list.

Landings with the WINDSONG have to be handled a bit differently than you might be used to. When landing with flaps, high, steep approaches are the way to go. If this is not your style of landing, I would recommend that you install spoilers. Some people have complained about the landing capabilities of the WINDSONG, but most of these people may have been trying to use the flaps too much like spoilers. Sorry folks, but it just doesn't work that way! Land high and steep, or add spoilers; the choice is yours.

CONCLUSION

As I mentioned earlier, you must pay attention to fuselage alignment throughout the entire fuselage construction. The foam wings require no special tools, and build in about 1/4th the time of a normal built-up wing.

The four WINDSONGS that I built weighed in with total flying weights of between 62 and 68 ounces. Specifications call out a 64-ounce (4-pound) flying weight.

After completing these WINDSONGS, it is my opinion that the WINDSONG does live up to its name. As Bob Dodgson says: "The WINDSONG's performance is a step beyond the current state-of-the art, even for multi-channel ships." I guess that I would have to agree.

*Bob Sealy is a member of the Minnesota R/C Soaring Society, and is editor of the club newsletter.

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S.O.A.R.'s Great Race IX ----- CANCELLED!

Jim Slater, S.O.A.R.'s president, sent out a letter on March 3rd informing all interested parties that S.O.A.R. has regrettably had to cancel Great Race IX, scheduled for June 1984. The alternate flying site procured by the club turned out to be inadequate to meet the needs of the Great Race cross-country events. Jim says that S.O.A.R. has been given hope, however, that Great Race IX will become a reality in June 1985, and will be back at its familiar and original site. On behalf of the club, Jim apologizes to one and all for any inconvenience the cancellation may have caused to 1984 soaring plans.

At this point, it may be worthwhile to mention that Frank Collins and the Cape Coral R-Sea Hawks of Florida have planned their own cross-country event in June 1984. It occurred to me that it might be possible to hold Great Race IX in Florida this year. I'll admit to being a bit presumptuous about this, and haven't really cleared the idea with anybody. BUT, wouldn't it be great if the Cape Coral bunch and some S.O.A.R. people could somehow work together on this and plan a jointly-sponsored Great Race? Frank Collins, 4421 13th Ave., SE, Cape Coral, FL 33904 is the man to write. You may wish to contact Jim Slater, too. His address is c/o S.O.A.R. 23546 West Fern, Plainfield, IL 60544.

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ELECTROSTATIC AUTOPILOT

I'm told by Rich Bonnell of St. Petersburg, Florida that he and John Gunsaullas used an autopilot with good success in the WINDSONG. The autopilot is manufactured by Ben Thomas, 1740 Aberdeen Terrace, Winston Salem, N.C. 27103. Telephone is (919) 723-0824.

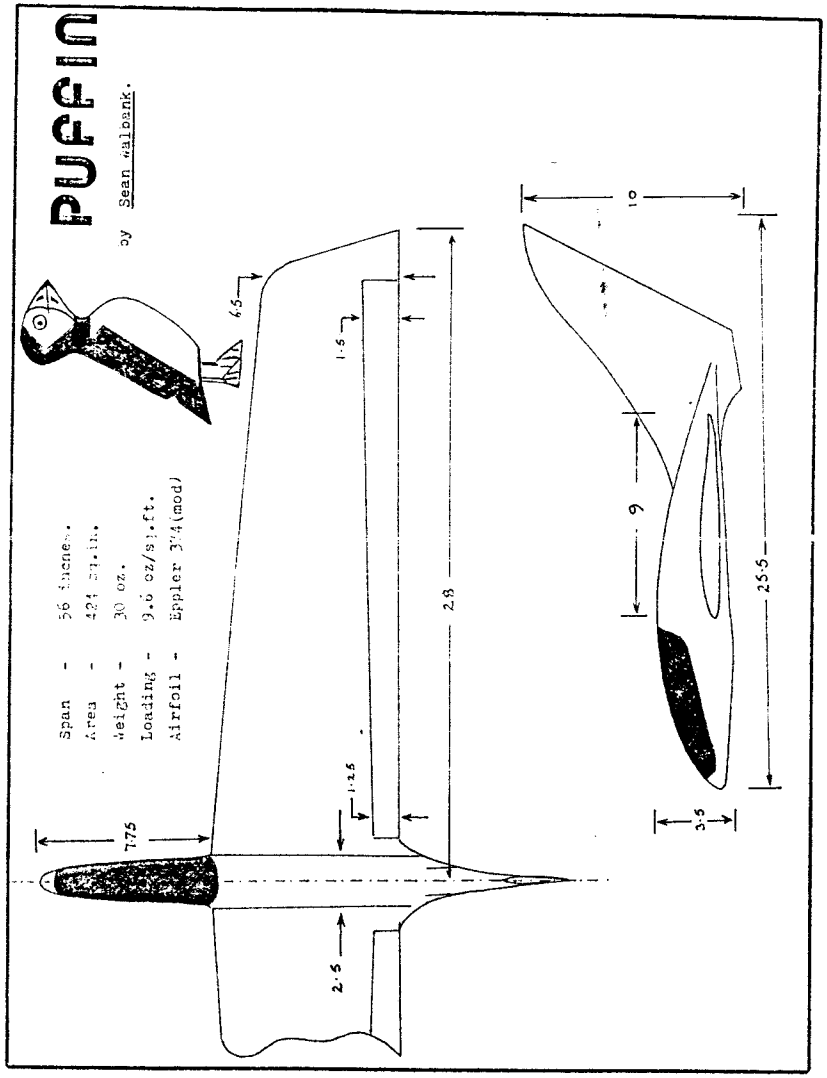
PUFFIN.... ... by SEAN WALBANK

Sean is editor and publisher of the WHITE SHEET an English club newsletter whose name is taken from their soaring site, a hill called The White Sheet. Appropriate name, eh?

Sean is an avid flier and designer of sailplanes, and PUFFIN is his tailless FUN machine. Sean says: "Although it's still in the developmental stage, it shows great promise."

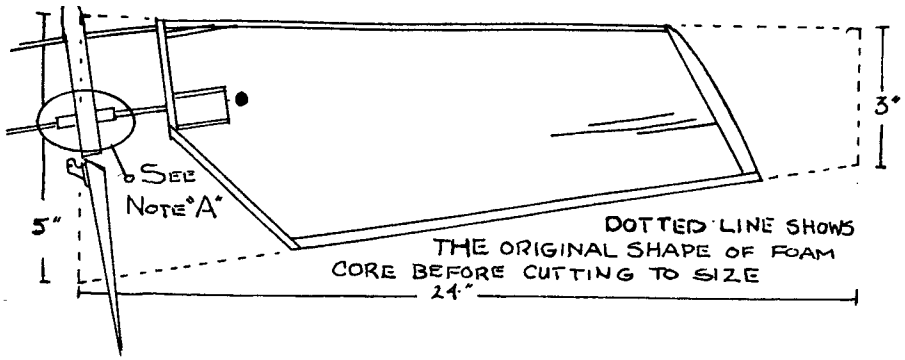
Sean also designed the Gryphon series of 2-meter ships, all of which are vee-tailed soarers. We'll show his new mini-soarer next time.

He plans to do a feature on RCSD in the White Sheet, so perhaps we'll get more input from England. Thanks, Sean.



THE FOAM STABILATOR SHOWN HERE IS PRINTED WITH PERMISSION OF COULTER WATT, AND THE LONG ISLAND SILENT FLYER NEWSLETTER EDITOR, GORDON STRATTON, WHO FIRST PUBLISHED IT. IDEAL FOR A SAGITTA 900, THE STABILATOR IS SUITABLE FOR MANY OTHER SAILPLANES, AS WELL. WE HOPE TO BRING YOU MORE COULTER WATT DESIGNS AND DRAWINGS IN THE FUTURE.

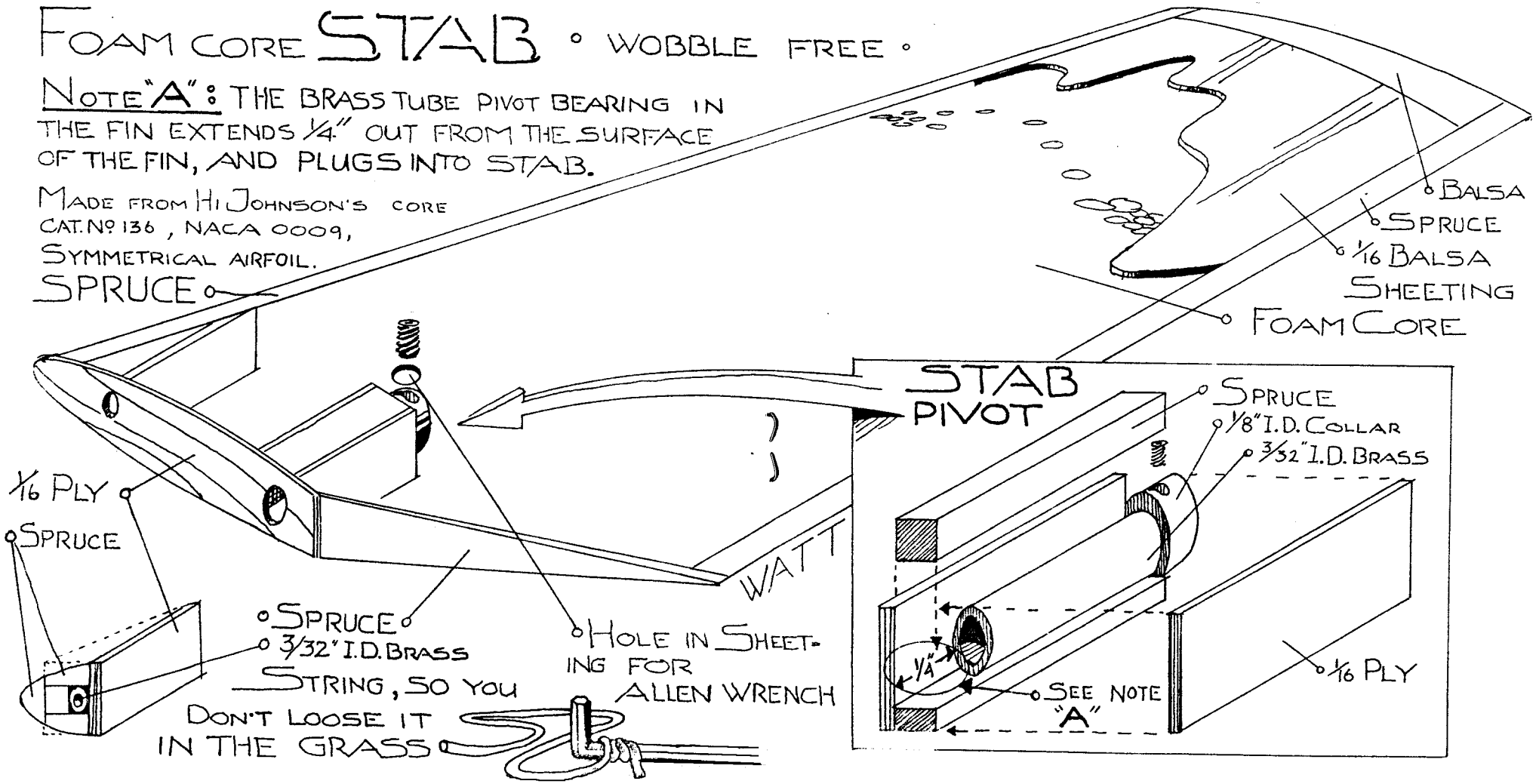
Jim Gray



FOAM CORE STAB • WOBBLE FREE •

NOTE "A": THE BRASS TUBE PIVOT BEARING IN THE FIN EXTENDS 1/4" OUT FROM THE SURFACE OF THE FIN, AND PLUGS INTO STAB.

MADE FROM HI JOHNSON'S CORE CAT. Nº 136, NACA 0009, SYMMETRICAL AIRFOIL.



WING CONSTRUCTION METHOD
By BRUCE ABELL *

I cut a foam "bed" from 2" foam block to the plan shape and contour of the wing undersurface and then epoxy (P.V.A. is okay, too) a 1/16"-thick plywood skin to it. This then becomes a jig to build a conventional, built-up wing or, when sealed and polished, a mould to lay up a g.r.p. (fiberglass) undersurface "skin" on. (A)

While the skin is still wet, I lay the leading edge in place and then allow everything to cure for 24 hours.

So far, experiments with two sets of wings have shown that the first layer of cloth should be 3/4-oz. material to give a good finish, and this is topped with 4-oz. cloth, and then 'mopped' with a roll of toilet paper rolled over it to mop up the excess resin (which adds only weight with no gain in strength). Also, it is adviseable to set in two or three extra spars (using 1/8" x 3/32" spruce set on edge) to prevent the g.r.p. skin from buckling with changes in temperature.

(You could also use, as I have, fiberglass rovings or even carbon-fiber rovings layed in with resin when you are laying up the cloth.) The spars are 'tacked' in place with cyanoacrylate adhesive, using the rib notches as guides. The ribs can then be spaced properly and also 'tacked' in place with the c.a. adhesive. The spars and ribs are then glued with epoxy adhesive of the slow-setting kind (e.g., 24-hour). The shear webs and top spars can now be glued in place, with the shear webs being epoxied directly to the bottom skin in the area of the carbon- or glass-fiber reinforcing.

The upper surface can now be covered with either sheet balsa, sheet balsa and cap strips or whatever your normal method requires. The next move is IMPORTANT, however. On a separate piece of material like plate glass, lay up a skin of epoxy and fiberglass in a manner similar to the way you layed up the skin on the plywood. This skin, upon removal from the plate glass (which gives it a shiny surface) becomes the upper-surface covering. Realize, however that it has no compression strength in and of itself. Therefore, you will have to use multiple spars to support the skin. I use 1/8" x 3/32" stringers for this purpose, and let them into notches on the upper rib contour. Four or five between the trailing edge and leading edge ought to be enough. (B)

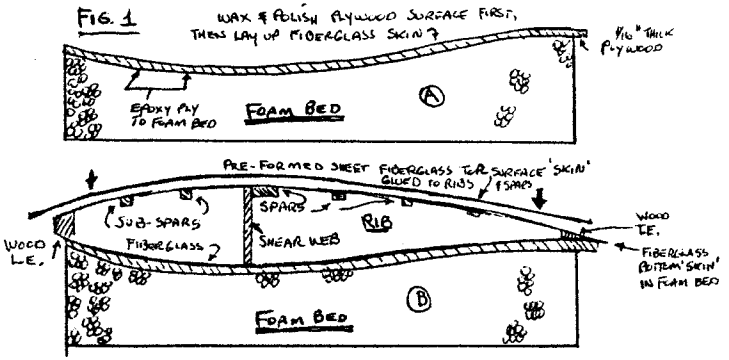
This system should result in a wing that is lighter and stiffer than a foam/veneer wing, and still allow a good section shape to be maintained. The finish will be high-quality, too.

Incidentally, the rib spacing can be increased more than 50% compared to a conventional wing. For example, if the ribs are normally spaced about 2" on centers, you can increase the spacing to 3" with this method.

Do not use carbon fiber for the upper surface spars because it has no compression strength (except in negative 'G' loads) so a good 3/32" thick x 3/8" wide spruce main spar is best, with balsa sub-spars of 1/8" x 3/32".

The whole unit released from the mould after completion (only the leading edge needs shaping after removal) very readily by sliding the blade of a pen knife under it. I use an emulsified silicone wax release agent on the glass and on the plywood, and I find it very satisfactory.

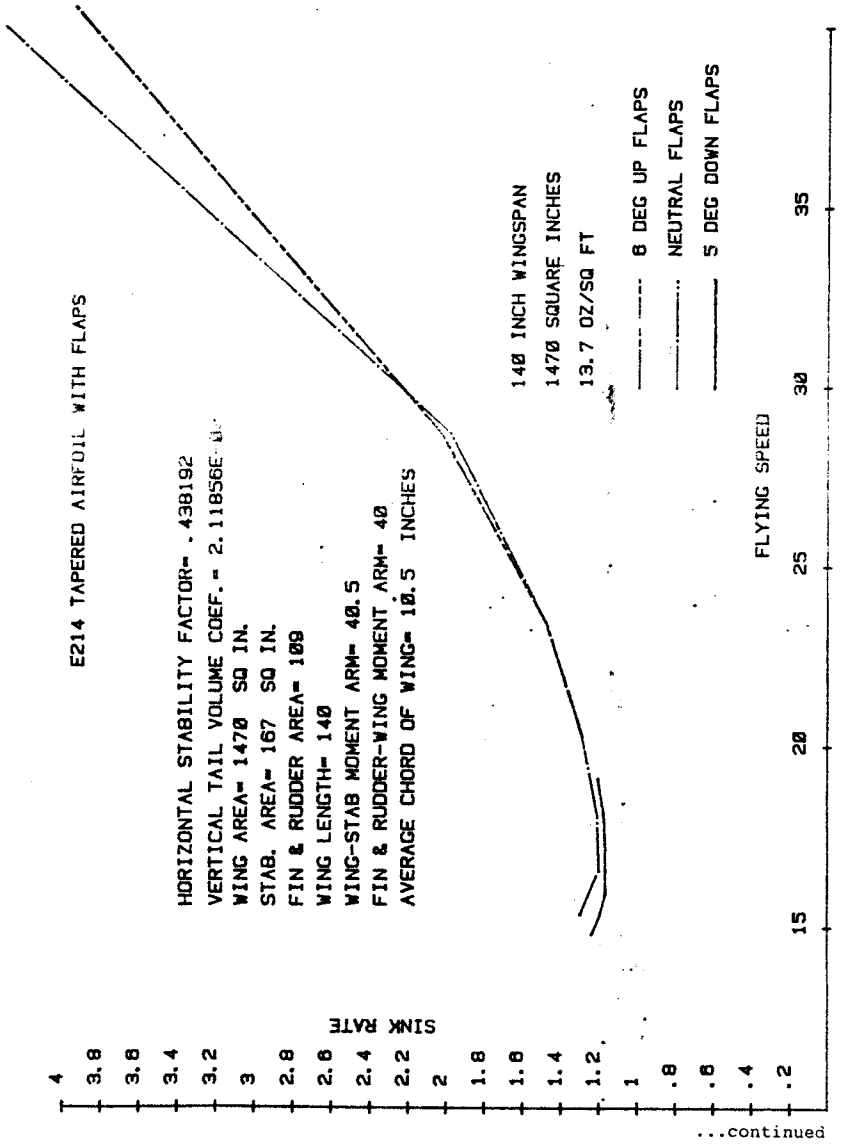
FIG. 1



* Bruce Abell, 17 Ferguson Street, Cessnock 2325, N.S.W., Australia

LASER-CUT AIRFOIL TEMPLATES AND PROJECT 'DYNA-SOAR

Lee Murray (laser-cut airfoil templates) writes us about some new plans of his. "I'm writing to tell you about my progress in constructing a scratch-built cross-country sailplane, and to tell you about the computer programs I've written for my TI-99. The programs compute the area, aspect ratio, an integrated 25% average chord position and average chord for the wings, stabilizers, fins and rudders. Typically, these devices have straight and tapered sections, swept leading and/or trailing edges which can make the computations unpleasant. A second short program converts the above information into lateral and vertical stability factors.



...continued

DYNA-SOAR (Murray letter) continued...

"Evaluation of these stability factors can be made knowing the purpose of your design, the criteria from literature sources, and comparison to other working designs to which you have access, and which you can evaluate using the software. You already know about my velocity polar program which calculates theoretical flight speed and sinking rate of the designs where weight, wing area, wing length, and airfoil performance data are known. (This will appear in SOARTECH, the technical journal of RC soaring, available from Herk Stokely, 1504 Horseshoe Circle, Virginia Beach, VA 23451). I hope to add programs for simulating flying and turning in the wind.

"With the aid of a friend, I hope to have a product to offer later in 1984...on cassette and disc for TI-99/4A, Commodore 64, and perhaps other computers. Price will be about $10 for all programs.

"My cross-country design, 'Dyna-Soar' for which you now have my computer results, is entering the construction phase. Facilities for a thermal sniffer, a strobe flasher, and a camera are planned. Of course the flapped wings will be made using my E-214 laser-cut airfoil pattern. I will be using the aluminum wing blades described in a 7-83 MAN article.

"I'd appreciate any feedback you may have on the design. I want to be able to minimize sink rate and penetrate well; hence the 25% flaps. The polyhedral wing and moderate stability factors are for security at high altitudes. RC Soaring Digest is right on target. Keep up the good work. P.S.: Dyna-Soar's wings will be cut by Mike Bame. Thanks for the lead. Best wishes. (Signed) Lee Murray"

Thanks, Lee, for the info. The results of your computations so far appear below. Perhaps the guys who read this would like to have a say about them. If so, I'll print 'em next issue. Say, how about a three-view I can run, Lee? We'd all like to see it.

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LEE MURRAY'S 'DYNA-SOAR' SPECS:

WING

AREA= 1470 SQUARE INCHES
ASPECT RATIO= 13.3333
LENGTHT OF WING= 140 INCHES
ROOT CHORD= 12 INCHES
TIP CHORD= 6 INCHES
LEADING EDGE TAPER= 5.5 INCHES
TRAILING EDGE TAPER= .5 INCHES
CENTER OF PRESURE= 3.85714 INCHES FROM LE
CHORD WEIGHTED CENTER OF PRESSURE= 3.75846
CHANGE IN TAPER AT 35 INCHES

STAB

AREA= 167.25 SQUARE INCHES
ASPECT RATIO= 6.12257
LENGTH OF STABILIZER= 32 INCHES
ROOT CHORD= 7 INCHES
TIP CHORD= 4 INCHES
LEADING EDGE TAPER= 3 INCHES
TRAILING EDGE TAPER= 0 INCHES
CENTER OF PRESURE= 2.875 INCHES FROM LE
CHORD WEIGHTED CENTER OF PRESURE= 2.75994
CORRECTION TO AREA= 8.75

FIN/RUD.

AREA= 108.75 SQUARE INCHES
ASPECT RATIO= 1.93333
HEIGHT OF FIN/RUDDER= 14.5 INCHES
ROOT CHORD= 11 INCHES
TIP CHORD= 3.75 INCHES
LEADING EDGE TAPER= 7 INCHES
TRAILING EDGE TAPER= .5 INCHES
CENTER OF PRESURE= 5.05562 INCHES FROM LE
CHORD WEIGHTED CENTER OF PRESURE= 4.76166