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Ready for that so-called bone-chilling first flight. Note how closely the folding prop blade lies against the side of the fuselage. The AMA numbers go a long way to enhance appearance.

Sweepo

Charles Schobloher

A winning Coupe d'Hiver rubber model which also may be flown as a small-field Unlimited Class rubber-powered job.

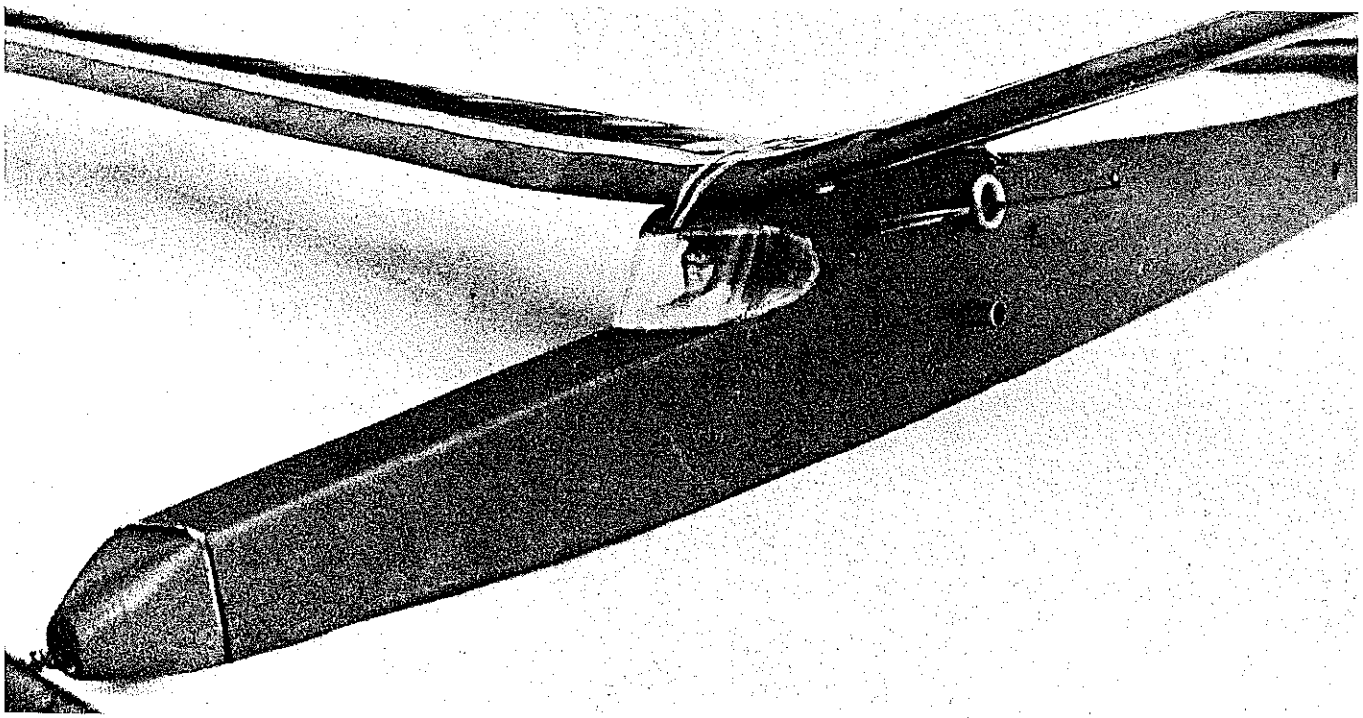
COUPE D' HIVER, a French word meaning "Winter Cup," is the name used to identify a small limited rubber powered endurance model. The rules are very simple: 1) Minimum fuselage cross section of 3.1 sq. in.; 2) Minimum weight of model 70 grams; 3) Maximum rubber motor weight of 10 grams; 4) Maximum of five flights, not exceeding 120 seconds each.

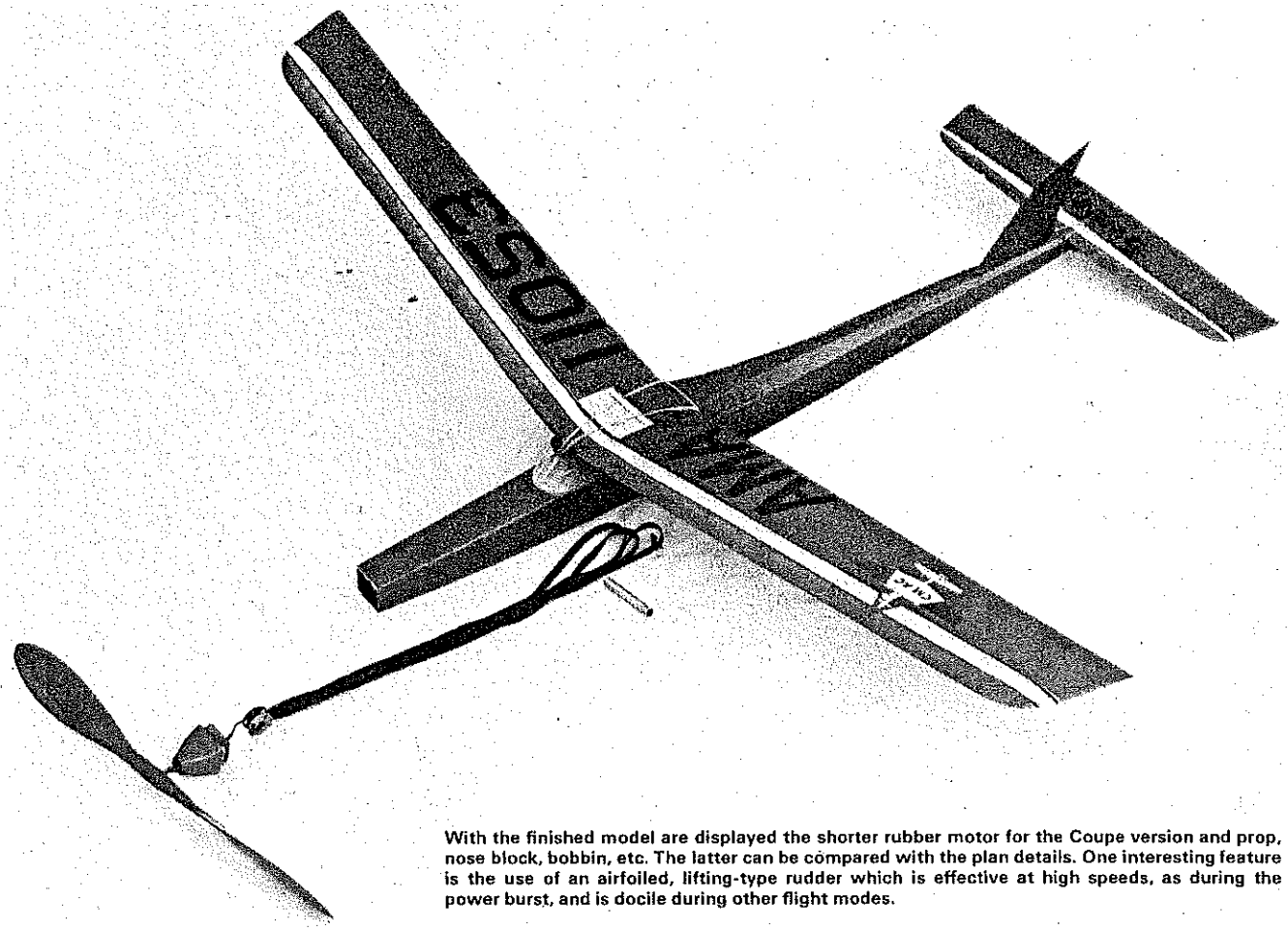
With all these minimum rules what is not often mentioned is the maximum amount of fun that this event has in store for modelers.

"Sweepo" is the fifth model of this type that I have built and enjoyed over a number of years. It did not "fly right off the board." In fact, it only flew after a new wing, fuselage and rudder, but is now ready, willing and able, placing well in most contests entered over a four-year period.

Fuselage: Begin construction by starting with the fuselage. Build two sides directly over the plans, one on top of the other, making sure that one is righthand and the other lefthand. The diagonal cross braces make the difference. When dry, block up the two sides over the planview making sure they are square. Add temporary perpendicular cross pieces every six inches or so, to the top and bottom. Again, after it is dry, remove from board and in your hand so to speak, start fitting and glueing diagonal cross pieces, alternating between top and bottom, removing temporary perpendicular cross braces as you go. You will notice that the top diagonals stop at the back of the wing mount. Add formers and sheet sides at wing mount and finish fuselage with 3/32 longerons aft of wing.

Close-up of fuselage shows two rubber peg positions for either the Coupe or Unlimited version. Note pop-up tail DT detail, also packing about nose block for down and right thrust.





With the finished model are displayed the shorter rubber motor for the Coupe version and prop, nose block, bobbin, etc. The latter can be compared with the plan details. One interesting feature is the use of an airfoiled, lifting-type rudder which is effective at high speeds, as during the power burst, and is docile during other flight modes.

To complete fuselage install 3/32 balsa fill on four sides of nose and two sides of motor peg area. (Two places, if you intend to also use model for Unlimited purposes.)

At this time you may prefer to add celluloid reinforcements to the inside of motor peg area. Simply cut out a ¾ in. diameter disk and cement to balsa filler before drilling a tight fitting hole for aluminum tube motor peg. If you have never tried building a diagonal braced fuselage, try it. It is not as difficult as it seems and is extremely rugged as well as light in weight. Don't forget the 1/32 ply former at the front to keep nose from opening up under maximum motor torque.

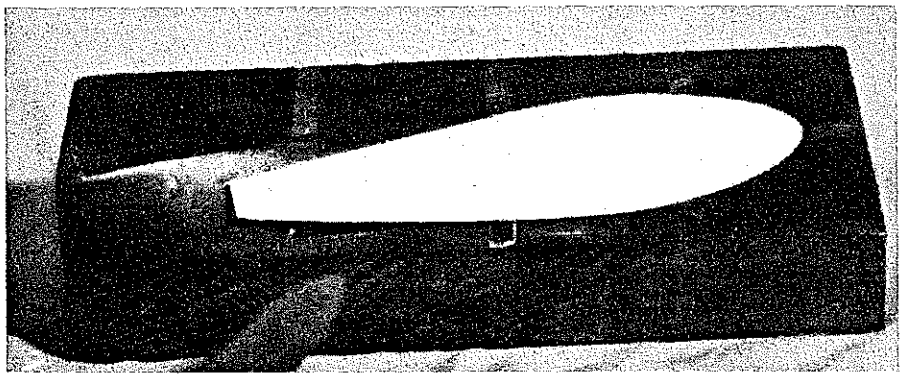
The rudder may be assembled to the fuselage at this time as covering can be attached to turtledeck longerons which extend beyond the rudder ribs. I like the lifting or airfoiled rudder as it is more effective at higher speeds such as during power burst, imparting a definite turning effect. At all other times it is very docile.

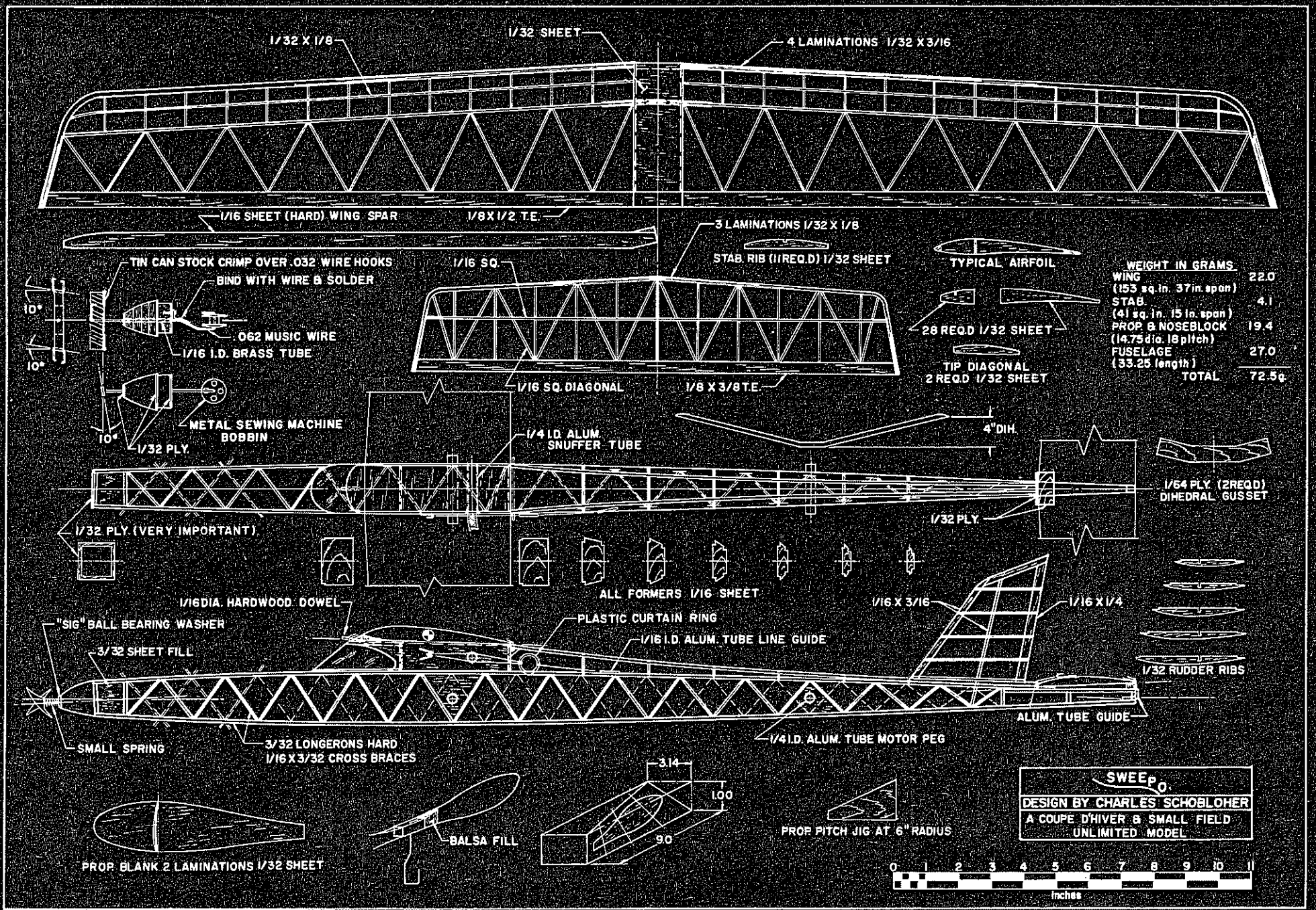
Wings: You will notice that the wing spar is constant in height although the wing tapers in the planview. This creates a proportionately thicker airfoil at the tips in relationship to the chord, giving the effect of washout without the necessity of warping the wing tips. I believe this helps in reducing drag during the all-important power burst, during initial seconds of flight, and still gives adequate stability at all other times.

The leading edge of the wing and tip is the laminated balsa method and is very easy to make. I like this method so well that I use it on most of my models. Make a form to the inside edge of wing plan shape from balsa or, as I do, from an old piece of ¼ in. plywood paneling. Wax the edges of the plywood form with a piece of candle to prevent sticking. Soak in warm water four pieces of 1/32 by 3/16 straight grain balsa, glue together with white glue and secure to the plywood form overnight. Make the wing spar as shown on plans and cut out the 28 half ribs and 28 diagonal ribs from 1/32 quarter-grain balsa. Block up the laminated leading edge to proper height to match ribs, and do same for trailing edge.

Pin down to plans along with the full depth spar and begin fitting diagonal ribs. Do this by cutting off rear edge of ribs to fit and later sand to conform with trailing edge. Add the 1/32 by 1/8 turbulator spar. After the two wing halves have dried, block up the wings to proper dihedral shown on plans and add the 1/64 plywood dihedral braces to both sides of wing spar. Add short section of leading and trailing edge of cen-

Rather like indoor practice the author lays up his prop blades over a shaped block, although in this case the blades are laminated. The designer considers this easier than carving prop.

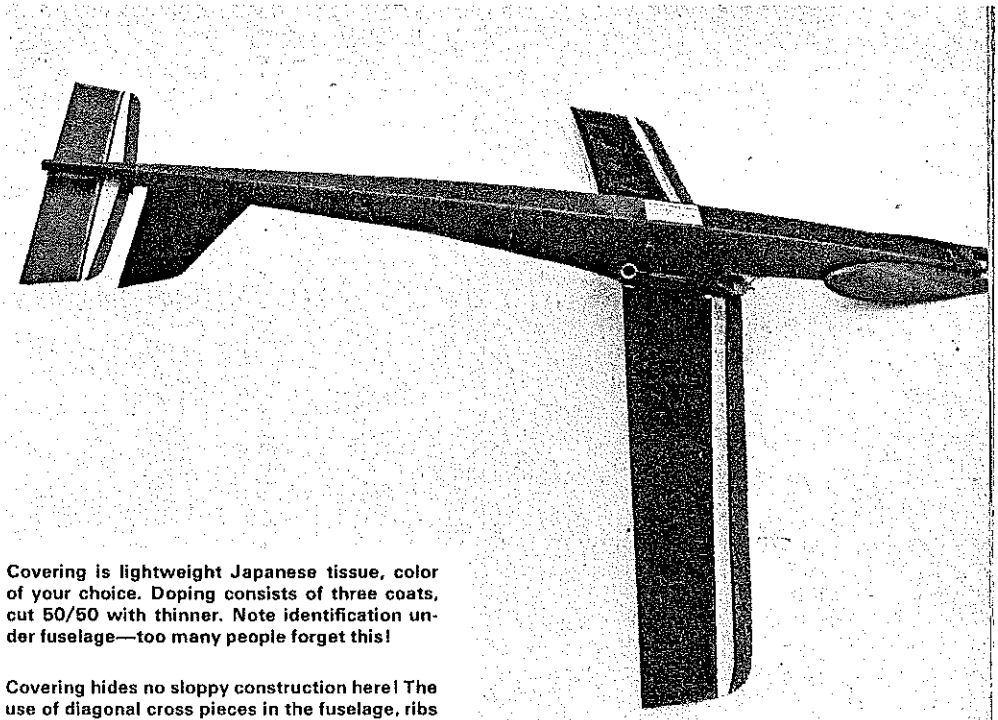



1/32 X 1/8
1/32 SHEET
4 LAMINATIONS 1/32 X 3/16
1/16 SHEET (HARD) WING SPAR
1/8 X 1/2 T.E.
3 LAMINATIONS 1/32 X 1/8
STAB. RIB (11 REQ.D) 1/32 SHEET
TYPICAL AIRFOIL
TIN CAN STOCK CRIMP OVER .032 WIRE HOOKS
BIND WITH WIRE & SOLDER
1/16 SQ.
10°
10°
.062 MUSIC WIRE
1/16 I.D. BRASS TUBE
28 REQ.D 1/32 SHEET
TIP DIAGONAL
2 REQ.D 1/32 SHEET
WEIGHT IN GRAMS
WING (153 sq. in. 37 in. span) 22.0
STAB. (41 sq. in. 15 in. span) 4.1
PROP & NOSEBLOCK (14.75 dia. 18 pitch) 19.4
FUSELAGE (33.25 length) 27.0
TOTAL 72.5g
1/16 SQ. DIAGONAL
1/8 X 3/8 T.E.
METAL SEWING MACHINE BOBBIN
10°
1/32 PLY.
1/4 I.D. ALUM. SNUFFER TUBE
4" DIH.
1/64 PLY. (2 REQ.D) DIHEDRAL GUSSET
1/32 PLY.
1/32 PLY. (VERY IMPORTANT)
ALL FORMERS 1/16 SHEET
1/16 DIA. HARDWOOD DOWEL
1/16 X 3/16
1/16 X 1/4
"SIG" BALL BEARING WASHER
PLASTIC CURTAIN RING
1/16 I.D. ALUM. TUBE LINE GUIDE
3/32 SHEET FILL
1/32 RUDDER RIBS
ALUM. TUBE GUIDE
SMALL SPRING
3/32 LONGERONS HARD
1/16 X 3/32 CROSS BRACES
1/4 I.D. ALUM. TUBE MOTOR PEG
3.14
1.00
9.0
BALSA FILL
PROP BLANK 2 LAMINATIONS 1/32 SHEET
PROP PITCH JIG AT 6" RADIUS
SWEEPO
DESIGN BY CHARLES SCHOBLOHER
A COUPE D'HIVER & SMALL FIELD UNLIMITED MODEL
0 1 2 3 4 5 6 7 8 9 10 11
inches

ter section, and plank top with 1/32 sheet; grain running spanwise. The full depth spar and diagonal ribs will give you an extremely strong and warp-free structure. After sanding wing and trimming leading edge to typical airfoil, I added a piece of heavy carpet thread to the leading edge, giving it a sharp point for air separation as well as a good "nick" protector.

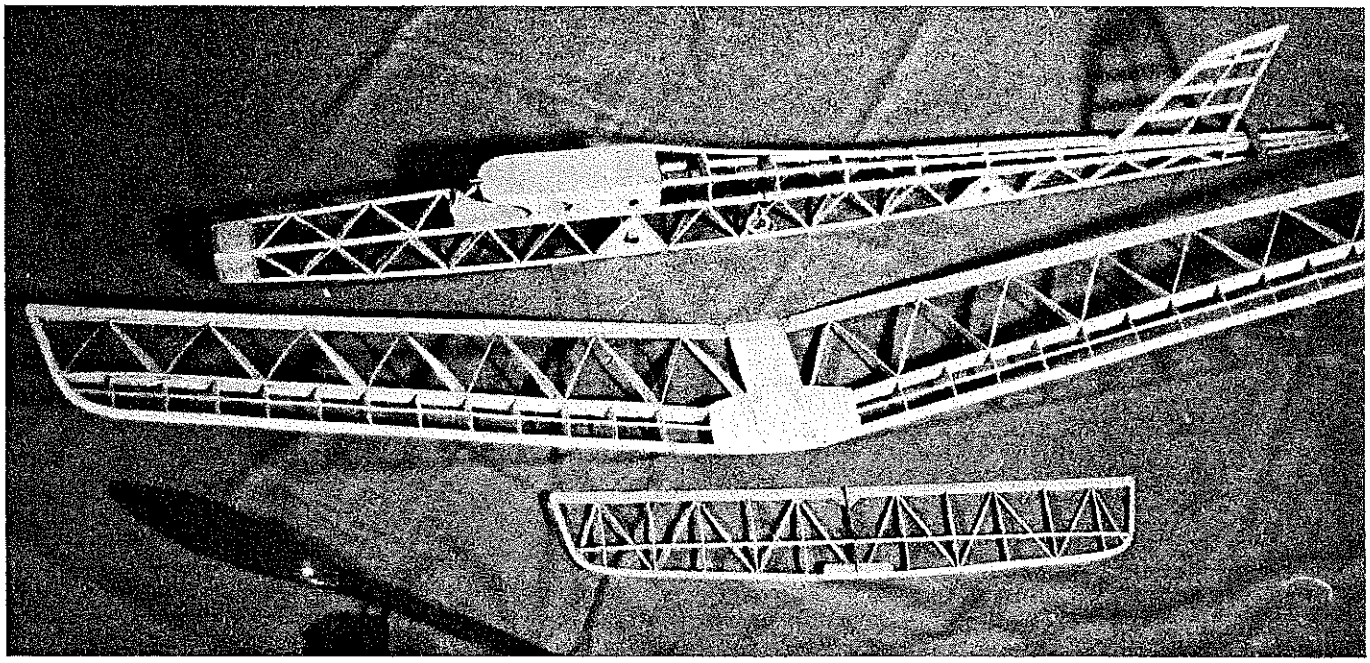
Stabilizer: The stab is built like the wing except use the lightest wood you can find. Small .020 wire hooks, shown in side view, for dethermalizer line and rubber hold-down should be epoxied to the stab before covering.

Prop: The propeller is the heart of a rubber model. It is this item that separates a great model from an "also ran." Utmost care should be exercised in making sure both blades are equal in shape, curve and set at exactly the same angle relative to the shaft. The blades should be balanced after



Covering is lightweight Japanese tissue, color of your choice. Doping consists of three coats, cut 50/50 with thinner. Note identification under fuselage—too many people forget this!

Covering hides no sloppy construction here! The use of diagonal cross pieces in the fuselage, ribs in wing and tail add great strength and resistance to warps. Steam out warps before flying.



assembly by holding shaft in nose block horizontally and sanding down the heavier blade until no rotation is seen. I use the bent laminated prop method as opposed to carving the prop from a single block and think it is easier and far superior. Use two pieces of straight grain 1/32 balsa cut to prop outline shown on plan. It may look like this is an extremely thin section but it is not. I believe that by keeping it thin, it permits the blades to flex, giving more pitch when motor is at maximum torque and normal pitch when motor is in cruise phase of run.

Begin making prop by carving a prop block from 1 in. thick by 3⅛ in. wide by 9 in. long piece of white pine. This is a hard job but, once the block is made, it can be used over and over again for any size blade up to 18 inches diameter having a true helical pitch of 18 inches. Perhaps it would be easier to carve a block from balsa but it is not as durable; suit yourself. Carve the block along the diagonal line on top face straight down to the lower rear edge on bottom surface. All sections parallel to hub face should be flat. Check your block from time to time with a straight edge.

I make the block flat and add a small piece of curved balsa when I want under-camber in the blades. In this manner you can make any amount of under-camber from flat to ⅛ in. or more from the one form block. After your prop form block is completed and sanded smooth, place a piece of Saran Wrap over the form, then the two 1/32 thick blades with epoxy between, fold over the Saran Wrap and add the other two blades and cover with Saran Wrap. Now use an "ace" elastic bandage or old rubber motor and bind four blades tightly to the form overnight. When completely set, you will have a pair of twisted blades ready for hinging and attaching to hub. Now make hub and tin-can-stock hinges. Bend hooks as shown on plan from .032 diameter music wire and crimp tin over the wire. Note the 10-degree angles in both directions; it is important so that when blades fold they will be tip to tip rather than at an angle to each other. Add balsa fill to blades at hinge area.

Take a piece of pine, drill .062 diameter hole for temporary shaft, add pitch templates at 6 in. radius on either side of shaft and set-up hub, hinges and blades. When

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is done after staining and completing the wing/landing gear assembly. Glue in the brass cabane struts between two bulkheads for support—get it good and solid. This is what you grab when handling this model, very convenient. As indicated on the plans, the nose section is shaped to take the Anzani engine with balsa stubs to hold the cylinders for the seaplane version. The land-plane cowling will cover the cylinder stubs when converted to the land-plane configuration. Finally, close out the bottom of the wing/landing gear assembly by gluing 1/32 plywood to the wing center on the bottom, which now becomes the "floor" for the cockpit. Next, attach the assembly to the fuselage with two nylon screws at each side of the engine, slipping the aft end into the saddle formed by adding the curved 1/64 plywood on the fuselage aft decking.

Flying instructions: Be sure the model is nose heavy. Weight can be removed later as needed to balance the model for normal flight attitude. The model is very docile and with the light wing loading and excess power, you'll enjoy its flight characteristics. Start with a 10" dia. 4" pitch prop to give you additional thrust margin—you don't want speed anyway. The seaplane flies just like the landplane. There is no significant difference in performance. Slide the floats to the position that will give the desired floating attitude and take-off! P.S. Don't try the vertical eights until you gain some confidence in handling the model. Happy splash-down—or bump-down, whatever the case may be!

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everything looks right, epoxy hinge hooks to blades. Be careful in not getting epoxy on hinge as it makes it a useless unfolding prop. Use a lot of care in setting up prop in jig as this is where all the difference in a good or bad assembly will come from. When dry, wrap thread binding around hub to retain tin can stock and around blade to retain wire hooks and recoat with epoxy. Now sand blades to airfoil shape and balance each blade as required. Sand smooth and cover blades with Japanese tissue.

Laminate and cross grain nose block adding 1/32 plywood as shown. Drill hole for brass tube and carve to fit fuselage. The 1/2 in. thick block should be a snug fit into the 1/32 ply front former of the fuselage. Bend hook, add spring and ball-bearing washer and finish assembly of prop and nose block. I like to use the sewing machine bobbin to hold rubber, as it affords me something to hang onto when detaching winder and hooking up prop assembly. I always use a winding tube inside the fuselage and, with an extension wire on winder, can pull winding tube back onto wire when motor is fully wound, and holding bobbin, detach winder and hook on prop. This method saves damaging either fuselage or prop if motor explodes while winding.

Now finish model by covering with lightweight Japanese tissue, color of your choice, and put about three coats of 50/50 thinned dope on everything. Balance model as shown on plans and steam out any warps that may have crept into the framework.

Flying: Now is the time to complete your "basement flying." That is, you have made a winding tube from rolled up mylar or a cardboard tube that is snug fit into fuselage, and practice winding your motor to check that prop turns free and true.

Take your model out to flying field to begin testing, testing, testing, until it flies perfectly. Put hand winds into motor and launch upwards at an 85-degree angle. If it stalls, add both down-thrust and right side-thrust. Now put 2/3 maximum power with winder and try again, making any corrections necessary. The model should make approximately two full turns to the right under maximum power. If during cruise portion of power-run the model doesn't climb, add more down-thrust. Keep testing your model, adding thin card stock shims such as I.B.M. cards between nose block and front of fuselage until you cannot improve flight. With approximately 375 turns prop should run for 19 seconds. This motor run is short compared to most "Coupes," however, I believe model should climb as fast as possible to get above ground turbulence. When properly adjusted you should be able to javelin throw model into ozone without stalling.

Remember; always to light your fuse, and may "Hung," God of Thermals, look with favor upon your model.