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BIG BOY

Few people even know what the duration of the Unlimited rubber job is in dead air—this one climbs higher than almost any gas job.

William H. Langenberg

UNLIMITED RUBBER is an event which seems to frighten away many competitive modelers. While several theories for this apprehension may be adduced, perhaps the most valid ones center around the difficulty of carving an efficient propeller and obtaining adequate good quality rubber.

Presuming these two concerns have deterred one or more of the readers of this article from building an unlimited ship, be assured that the problems can be surmounted. In the case of the propeller, a precarved version with all folding hardware attached is available from Sig Manufacturing Co., Inc. Likewise, rubber with the quality and performance necessary can be procured from either Sig or FAI Model Supply.

In the opinion of the author, unlimited rubber offers a unique opportunity for original design and construction theories. For the class is almost totally unfettered by rules restricting design or power. The only limitation set forth in current AMA rules is that the wing area not exceed 300 sq. in. projected. Any amount of rubber power is allowed, no motor run limits are established, and landing gear is not required.

The result of this flexibility has allowed performance, in my judgment, to exceed that of any other free-flight class. Those readers who have not seen a high-performance unlimited rubber model climb to incredible height, fold its prop, and settle into a flat, floating glide have missed one of the truly rewarding sights in the free flight world.

In an inducement for modelers who may be neophytes at unlimited rubber, let me assure you that "Big Boy," if built and adjusted according to the plans, can climb higher than almost any free-flight gas model in competition today, particularly now that the VTO engine run differentials have been eliminated.

So if you seek an additional free-flight event, or desire to build a model with truly superior free-flight duration potential, perhaps Big Boy may be for you.

Construction

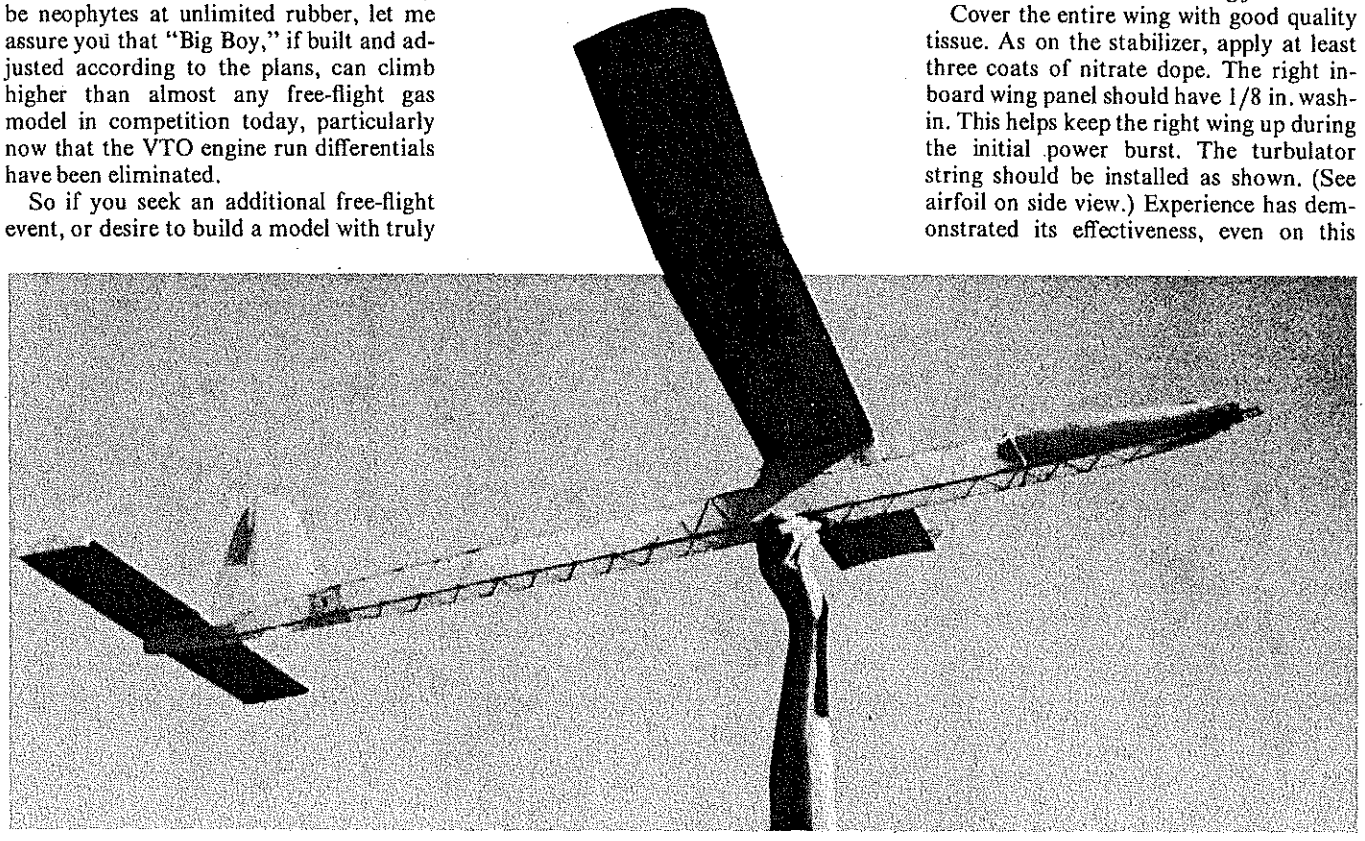
Stabilizer: Begin construction with the stabilizer so that it can be covered, doped, and cured before any test flights are attempted. Use contest grade balsa for ribs, trailing edge, and tips to keep down weight. Assemble the parts on a true, flat surface, adding the 1/16 × 1/8 spruce D-T hooks as the last operation. The stabilizer should be carefully sanded and covered with tissue. The tip plates should be added before the tissue is water sprayed and given at least three coats of thinned dope. I normally prefer nitrate to butyrate dope because it appears more resistant to moisture changes in the air. The completed stabilizer should be absolutely free of warps. Finished weight should not exceed 8 grams.

Wing: Next in construction sequence is the wing. It is straightforward and should present few building problems.

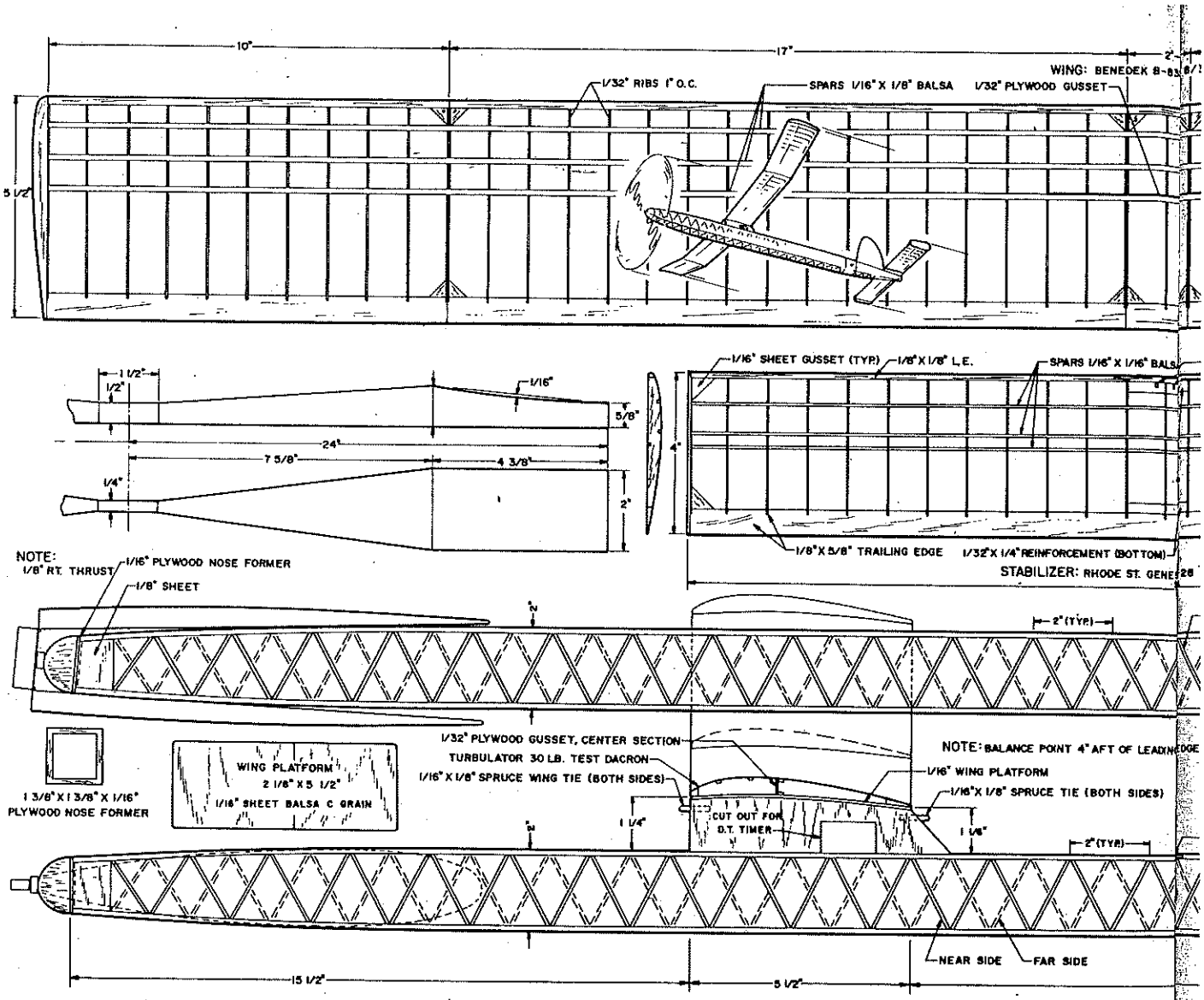
Select the wood for the wing tips with care, as they should be kept as light as possible. For the two inboard wing panels, ribs should be cut from 1/32 quarter-grain stock. The trailing edges are preferably carved from similar 1/8 sheet balsa. During assembly, the front of the trailing edge should be packed up to conform with the airfoil as shown on the plan.

Assemble the wing panels to the polyhedral dimensions indicated, using liberal amounts of glue on all joints. Do not cement spars to ribs at the polyhedral breaks until the panels are blocked up to the proper angles. Install the plywood gusset and triangular reinforcements as shown. Carve the wing tips from soft 3/8 sheet, then sand the entire completed structure carefully to facilitate an attractive covering job.

Cover the entire wing with good quality tissue. As on the stabilizer, apply at least three coats of nitrate dope. The right inboard wing panel should have 1/8 in. washin. This helps keep the right wing up during the initial power burst. The turbulator string should be installed as shown. (See airfoil on side view.) Experience has demonstrated its effectiveness, even on this



The author's model displays the long fuselage and high aspect ratio wings typical of Unlimited rubber jobs. The wing must not exceed 300 sq. in. of area. Any amount of rubber is permissible, no motor run limits exist, landing gear is not required. All that spells performance.



multi-spar wing. Set the wing aside and allow it to cure thoroughly. Finished weight should not exceed 32 grams.

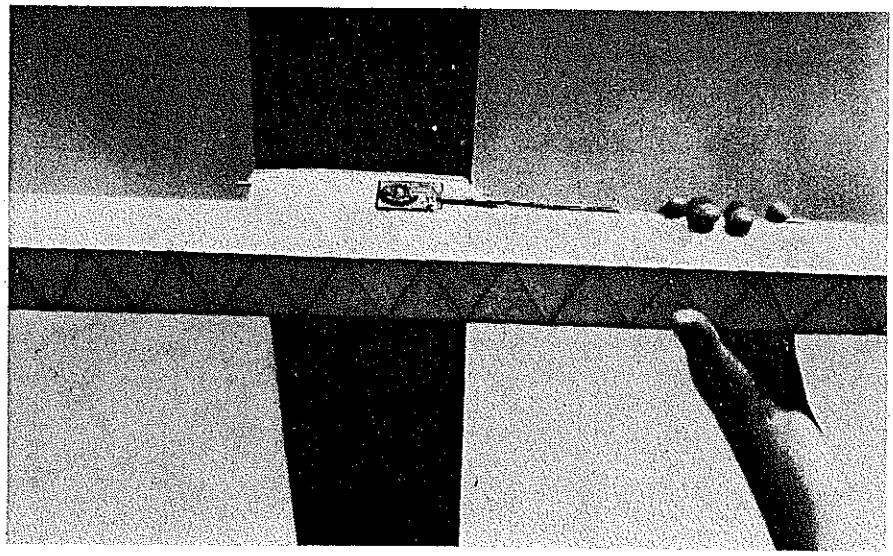
Fin: The fin is cut from soft 3/32 in. sheet to the outline shown on the plans. It should be carved and sanded to a streamline shape as indicated so as to give a left turn in the glide.

Fuselage: Select four hard ⅛ × ⅛ balsa strips, 48 in. long, for the longerons. If 48-in. length stock is not available, 36 in. strips can be used if they are properly spliced. When splicing, use a ¾-1 in. long bevel, carefully fitted, and double glue the joints. Do not locate the splices at the same distance along the fuselage length. The best position for a splice is at the junction of two diagonals, which act as reinforcing members.

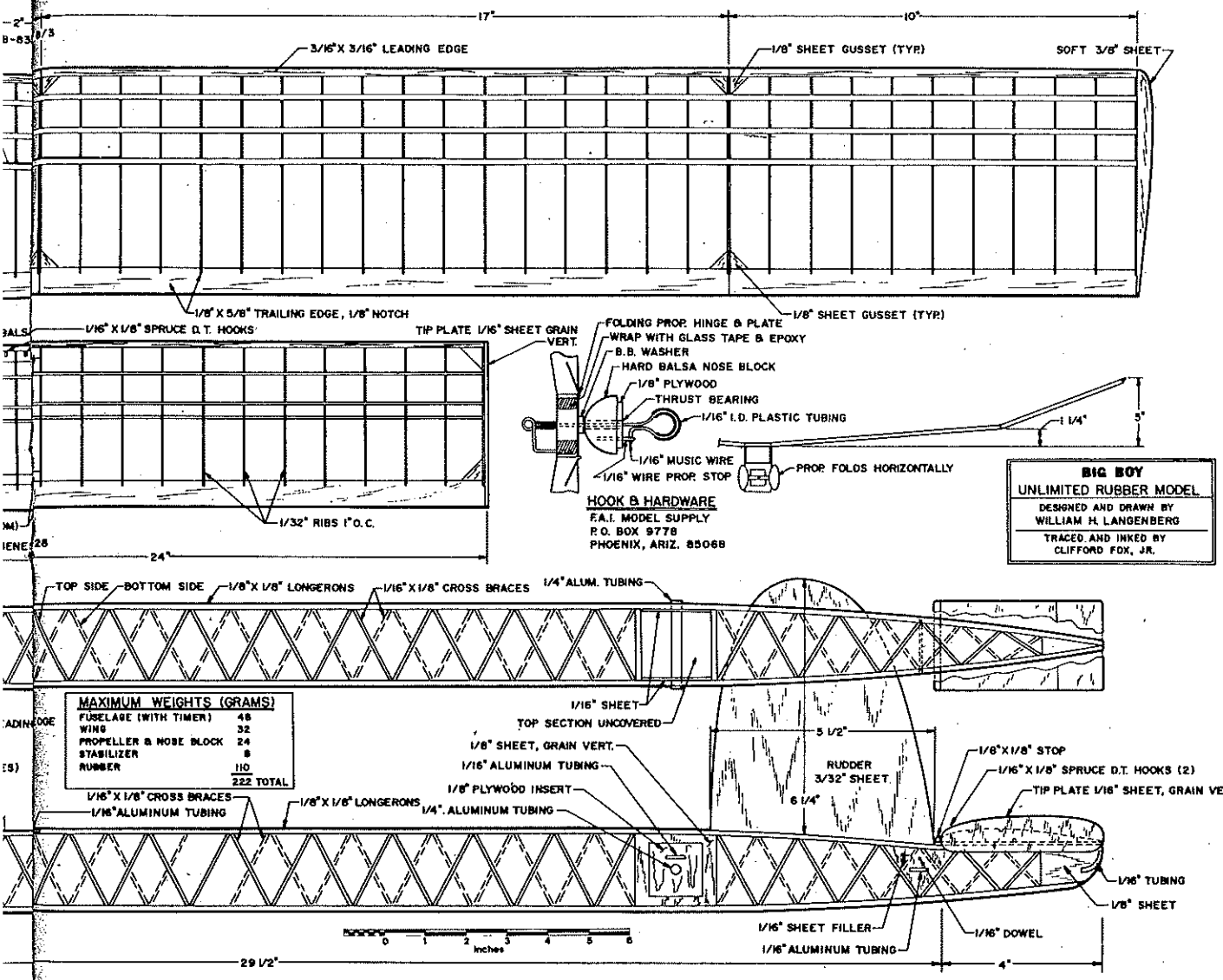
Build two fuselage sides on the plan, ensuring that the diagonals do not run the same directions on both sides. Add the ⅛ sheet fillers for the rear rubber peg. It is prudent to dope both flat sides of the 1/16 × 1/8 diagonals before cutting them to size so that the rubber lube will not be absorbed by the raw wood. The longerons should also be doped before building the fuselage sides.

When joining the fuselage sides, I normally tack glue ⅛ × ⅛ cross pieces to the longerons about every 12 in. to set up the fuselage shape throughout the length of the square section. Then insert the ⅛ × 1/16 diagonals, proceeding equally along top and bottom. The tack glued ⅛ × ⅛ pieces are removed as diagonals take their places. If you prefer, a simple jig can be constructed to facilitate fuselage assembly.

Add the ⅛ sheet balsa fillers at the front of the fuselage, then glue the remainder of the diagonals in place. Insert the 1/16 sheet reinforcing pieces inside the rear motor hook section as indicated on the plan. Now



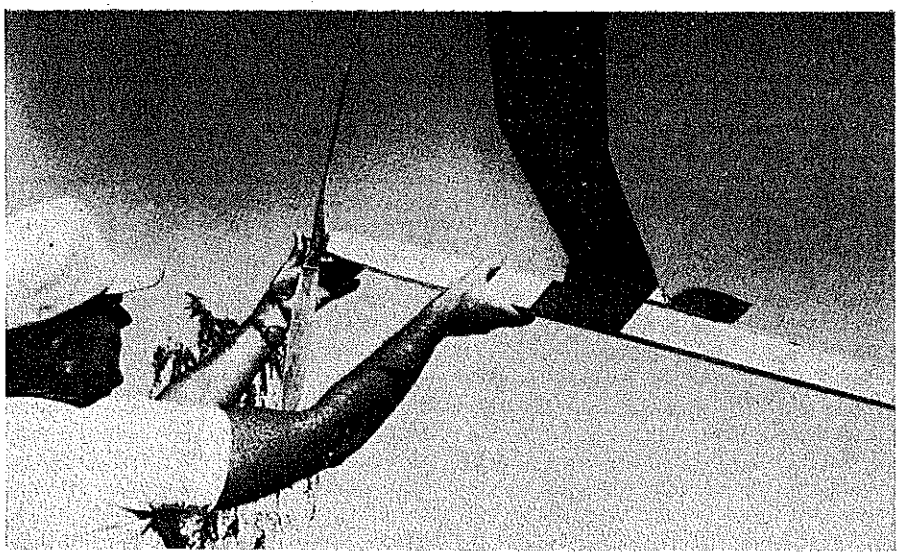
The timer for the pop-up stabilizer dethermalizer is conveniently located in the side of the pylon. Your attention is directed to the "turbulator" thread on plans—aft of leading edge.



FULL-SIZE PLANS AVAILABLE . . . . SEE PAGE 104

carve and sand the ⅛ in. right thrust into the fuselage nose. Cut out the 1/16 plywood nose former and glue it accurately in place. Sand the entire fuselage smooth and cover it with tissue, grain perpendicular to the longerons. For durability you may wish to double cover the fuselage bottom, cross graining the tissue.

To finish the fuselage, cut out the wing mounts plus the stab and wing platforms. Glue them to the fuselage as shown, then add the 1/16-in. aluminum tubing D-T line guides and the 1/16 dowel rubber hook. Finish the assembly by gluing the rudder to the fuselage, ensuring it is properly aligned. If you elect to use a D-T timer, it should be positioned as shown. Finished weight of the completed fuselage assembly should not exceed 48 grams, including D-T timer.



The propeller shown in the pictures is a Sig 24-in. pre-built folder with blades trimmed to outlines shown on the plan. But if you wish to hack your own, plans show 24 by 24-in. pitch.

Propeller: Two alternative propeller assemblies are shown. The model in the photographs uses a Sig 24-in. pre-built folding propeller with the blades trimmed to the outline shown.

An alternative propeller, for those more experienced or energetic modelers who desire to carve their own, is also detailed on the plan. This is a 24 × 24 in. version which should have about 1/16 in. undercamber in the blades. I have used both type props on Big Boy, with no significant changes in performance.

If you elect to carve the propeller, first select a straight grained 1 × 2 × 24-in. balsa block. Drill the center hole, then saw the blank to shape. Carve the undercambered sides and sand them smooth, ensuring that the two blades are symmetrical. Then carve away the back sides of the prop until the blades are about 3/32 in. thick at mid-point. Finally, shape the blades to the finished outline.

The hinge plate shown on the plan is made from 1/32 brass sheet, with a short

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have run across. An added advantage is that this method adds very little drag.

In the next column, I will bring up the topic of moveable leadouts.

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FF Duration/Meuser

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Models By the Peck, By Heck: Peck-Polymers, long famous for its free flight scale and sport kits, plans, and hardware is now heavily into CO-2 power. Peck stocks the Brown single and twin, and the new Telco and Shark motors. His "One Nite 16" kit for a built-up 16"-span sport model now includes instructions for converting it to CO-2 power. But it can be converted back to rubber power in a minute or two.

Of great interest to CO-2 enthusiasts are the tanks offered by Peck in five sizes ranging from a teeny 1¾ cc to 20 cc capacity. And, too, Peck offers a goodie that adapts Ansul fire-extinguisher cartridges to any of the three brands of CO-2 motors, and provides flights at a fraction of the cost of using the small cartridges usually used. Send for Peck's complete catalog to PO Box 2498, La Mesa, CA 92041.

HLG Dethermalizer: Four types have been used with varying degrees of success: The dropping nose weight; pop-up elevator; spin-tab; and the Geraghty system. The latter consists of no DT at all, but lots of gliders. The pop-up elevator type, perfected by Bill Blanchard, seems to be increasing in popularity. But here is a new twist on the old spin-tab device, submitted by Mark Drela:

"Many fliers have abandoned the spin-tab DT since it tends to produce screaming spiral dives, which defeats the original purpose: to bring the glider down *safely*. With my version of the spin-tab system, destruction of the model is avoided by placing the tab on the *outside* of the glide circle. Then, instead of the glide circle tightening into a suicidal spiral dive, the glide circle either opens up or reverses, and the glide path angle steepens to about a 30-degree angle from the horizontal. With the nearly straight flight path and a moderately rapid descent, the model simply punches through the strongest thermals without hitching a ride into the next county. (Other types of DT-s have been known to be ineffective in strong thermals.)

"The tab is cut from .010 brass or .015 aluminum sheet, and is 2 in. to 2½ in. long. The glide angle is sensitive to the width of the bottom flange, which can be trimmed to achieve the desired angle of descent, or in some cases, completely removed. Turning effect can be adjusted by trimming the length of the tab, or by altering the opening angle."

Sounds like it's worth a try. All HLG DT systems use fuses of course. A common cause of malfunction is caused by the rubber band pressing too tightly against the fuse, or what is even worse, pressing the fuse against a heat-robbing piece of metal. The force of the rubberband should be supported by something other than the fuse in such a way that it presses lightly against the fuse.

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length of 1/32-in. I.D. brass tubing rolled and epoxied into each end. The 1/32 hinge wire connects the blades to the hub.

Complete the propeller assembly by carving the noseblock from hard balsa. The ball bearings, shaft, thrust bearing, and spring shown in the drawing can be obtained from FAI Model Supply, Box 9778, Phoenix, AZ 85068. A 1/8 plywood insert glued to the rear of the nose block should fit snugly into the front of the fuse-