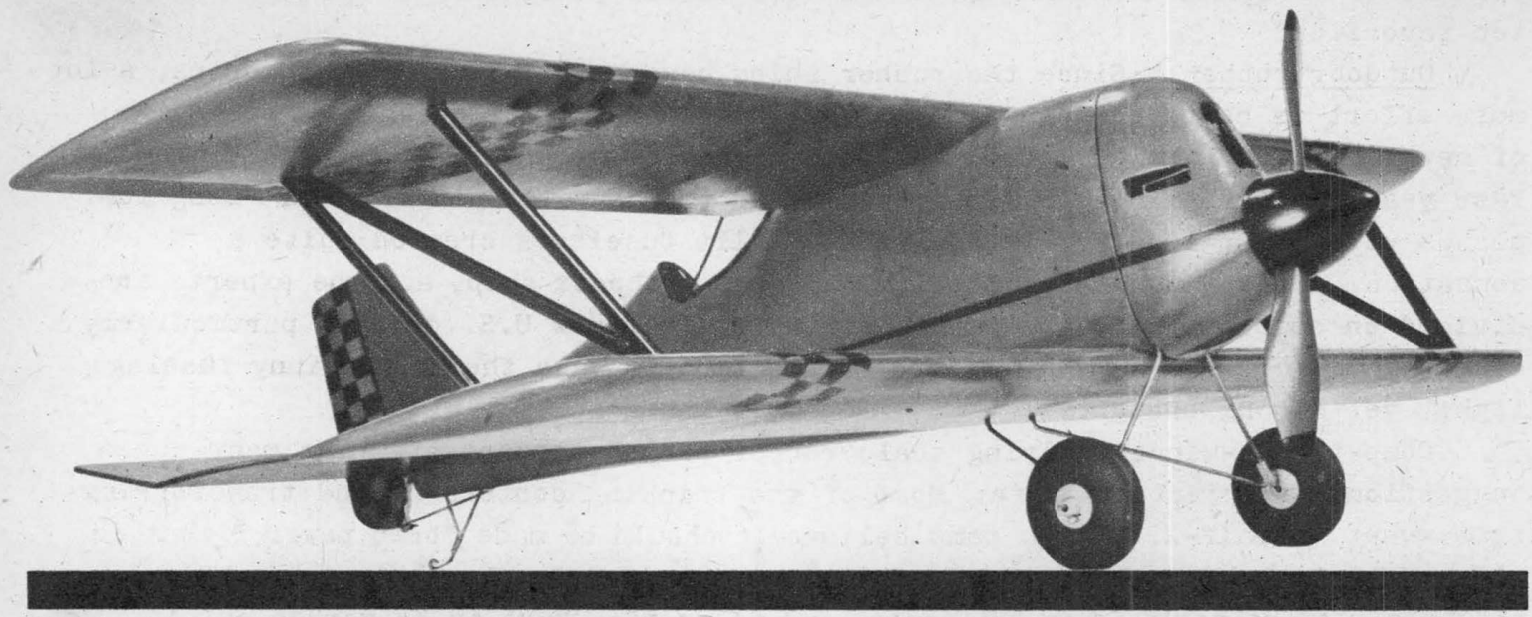


DOUBLE WHAMMY

By WALTON HUGHES

Negative stagger, "real" appearance distinguish this scale-like stunter

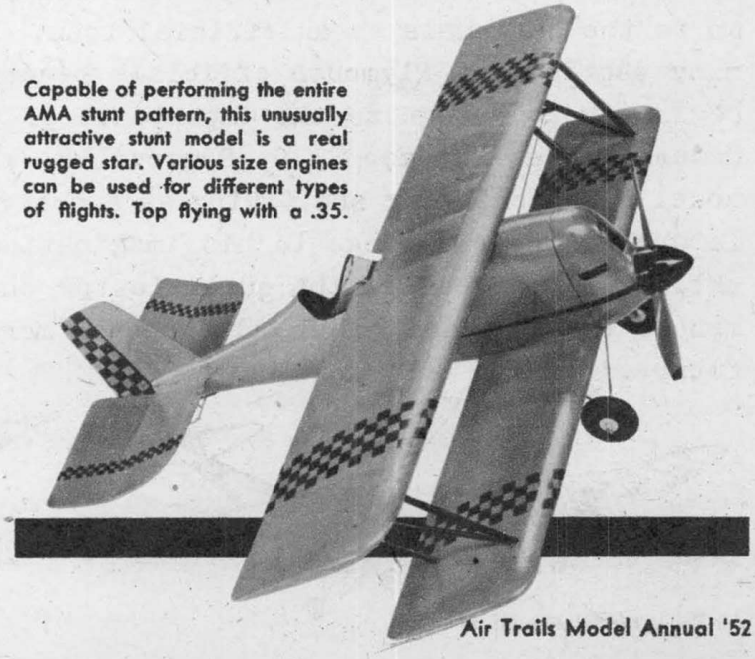
■ *Double Whammy* is a good-looking biplane designed for many hours of flying as well as nice appearance. This ship could be used for control line sport flying, with a Fox .29 or .35 engine, and will fly very well with the extra weight of a super finish. It also makes an excellent contest control line stunt model for AMA rules when built with careful attention to reducing weight. A Fox .35 or engine of equal power should be employed for stunt.

The odd fuselage construction was incorporated in this design to eliminate troublesome cabane struts between the fuselage and upper wing. These struts are good looking but are usually the main source of trouble in assembly, and are so weak that the top wing flips off at the first rough landing. The *Double Whammy*, with top wing attached directly to the fuselage, will withstand considerable bouncing around.

If this ship is being built for contest stunt flying, overall weight and correct balance should be kept in mind at all times. The two controlling factors are proper selection of wood and limiting the weight of the finish or paint job. The fuselage is quite large in sections and will have sufficient strength when a soft grade of wood is used throughout. Select soft to medium 3/32" sheet for the sides. 1/16" sheet would be strong enough but this does not allow sufficient material for sanding when the complete fuselage is assembled.

The bulkheads should be lightweight quarter-grained balsa. Balsa blocks for fuselage top and bottom and wing tips should be soft enough so that the corner can be mashed down slightly with the ball of the thumb. This type of wood is fast to carve and will be light when hollowed down to ⅛" thickness. The elevator and stabilizer are at the extreme rear of the ship and will cause the plane to be tail heavy unless light wood is selected. Try to find a piece of soft ⅛" sheet that is slightly hard on one edge. Place this edge along the hinge line when laying out the parts. In general, all parts to the rear of the wing should be made from the lightest wood, and heavier, stronger material used around the front.

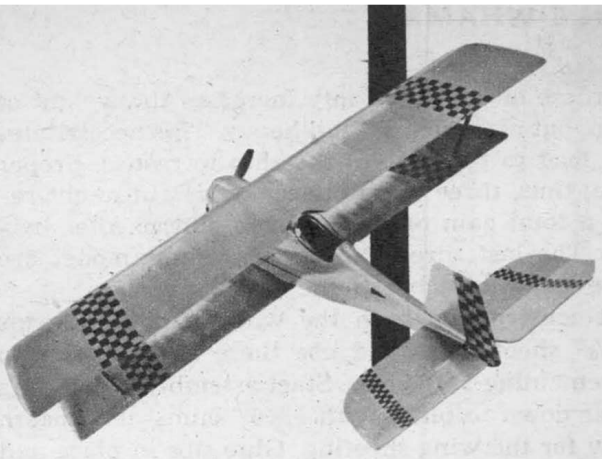
As mentioned before, the paint is the second con-

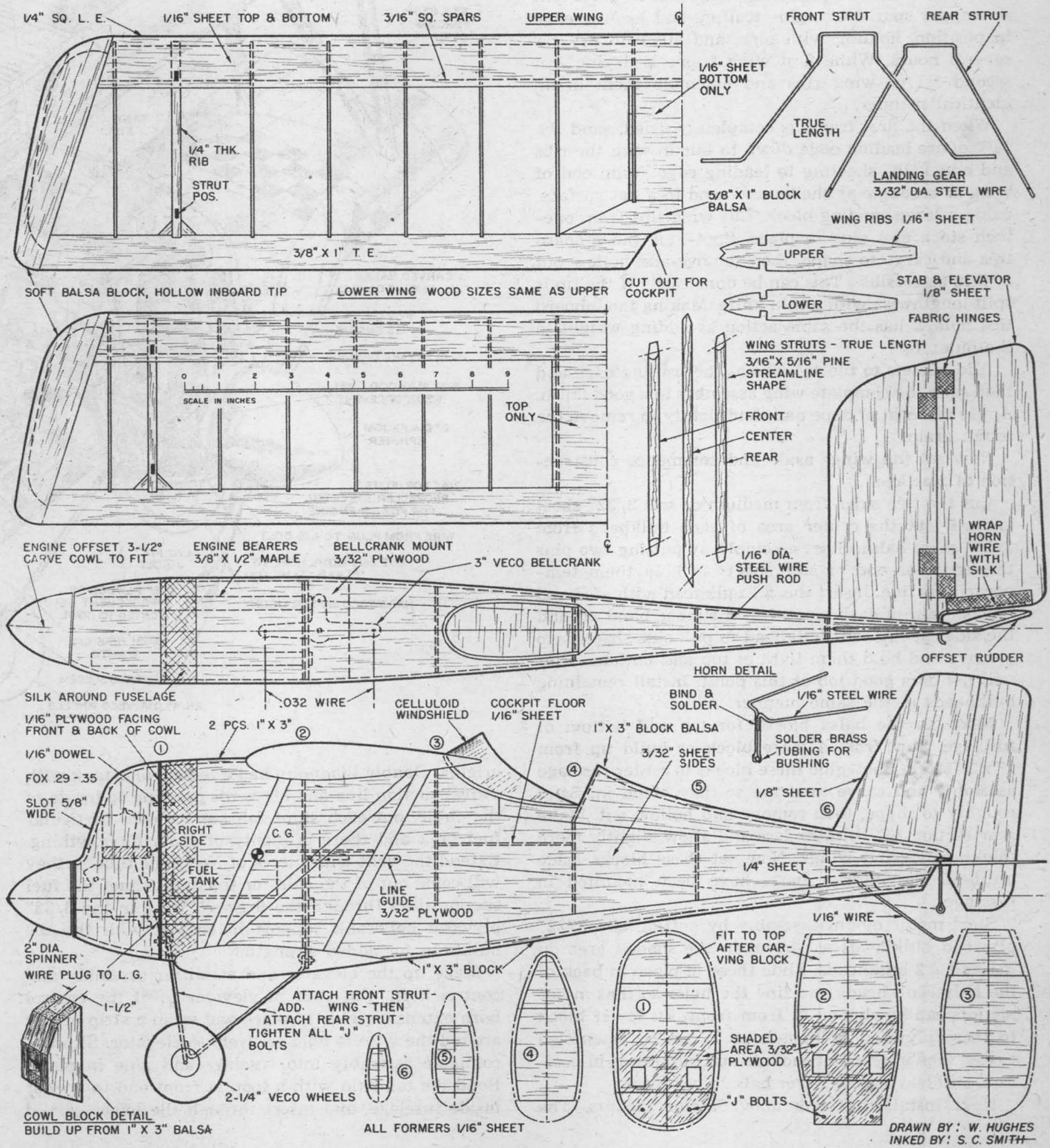


Capable of performing the entire AMA stunt pattern, this unusually attractive stunt model is a real rugged star. Various size engines can be used for different types of flights. Top flying with a .35.

trolling factor in weight and balance. A good job can be done by covering the fuselage and tail surfaces with the lightest gas model paper available, then adding one coat of filler and sanding smooth. The wings should be covered with paper. Follow with two or three coats of color and fuel proofer. A lighter job could be produced by using some fuel proof dope such as Aero Gloss or STA. This eliminates the fuel proof coating and saves considerable weight.

Too much weight from poor selection of wood or





DRAWN BY: W. HUGHES
INKED BY: S. C. SMITH

an overdose of paint not only increases the weight of the ship, but also makes it tail heavy. This necessitates adding lead to the nose of the ship to restore proper balance; thus, three extra ounces of weight might result in a total gain of six or seven ounces after balancing. The last three ounces on a stunt model are like the straw that broke the camel's back.

Start construction with the wings. Cut two strips from ¼" sheet balsa and use these as templates to carve remaining 1/16" ribs. Start assembly by pinning one spar down to plans with 1/16" shims underneath to allow for the wing sheeting. Glue ribs in place and add upper spar. Next, glue trailing and leading edge in position, holding with pins, and allow to dry for several hours. While first wing frame is drying, cut second set of wing ribs and assemble them in an identical manner.

When the first frame is completely dried, sand the ¼" square leading edge down to fair in with the ribs and add 1/16" sheeting to leading edge. Trim end of wing at an angle as shown and sand to a flat surface, using a large sanding block. Cut wing tips from one-inch stock and glue in place. Spot-glue the inboard tips and carve to shape, then remove and hollow out as thin as possible. This can be done easily if the tip is split lengthwise with a thin knife. Making the inboard tips hollow has the same action as adding weight in the outer tip.

Add gussets to the ¼" ribs at the trailing edge and then sand the complete wing assembly to a good finish. Apply one coat of dope and sand lightly to remove the rough grain.

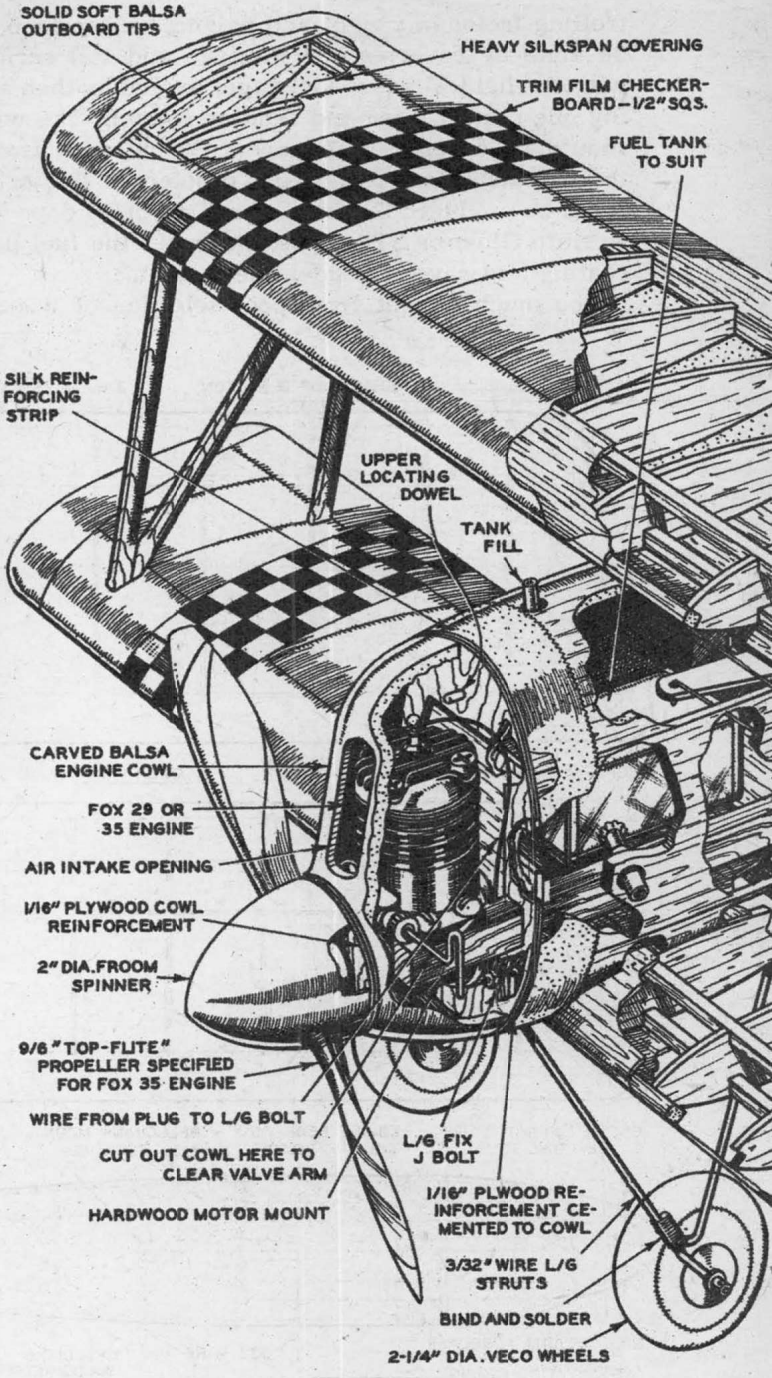
Now set the wings aside and commence construction of fuselage.

Cut the two sides from medium or soft 3/32" sheet and cut out the center area of each bulkhead from 1/16" sheet balsa. Start assembly by putting two pins through rear end of side sheets to hold them temporarily in line. Insert the #1 bulkhead with glue and put one pin in each side, then a rubber band around the sides at this first bulkhead to pull side sheets into a curve and hold them tight at top and bottom. Pins will not do a good job at this point. Install remaining bulkheads in the same manner.

Next cut the balsa blocks for top and bottom of fuselage. Saw from a large block or build up from 1" x 3" stock. Spot-glue these blocks to center fuselage assembly and carve to shape so they blend in. Sand roughly to shape, then remove and hollow out. Make rear section ⅛" thick or less and allow slightly more thickness around wings. Now set these blocks aside until all the interior parts have been mounted in fuselage.

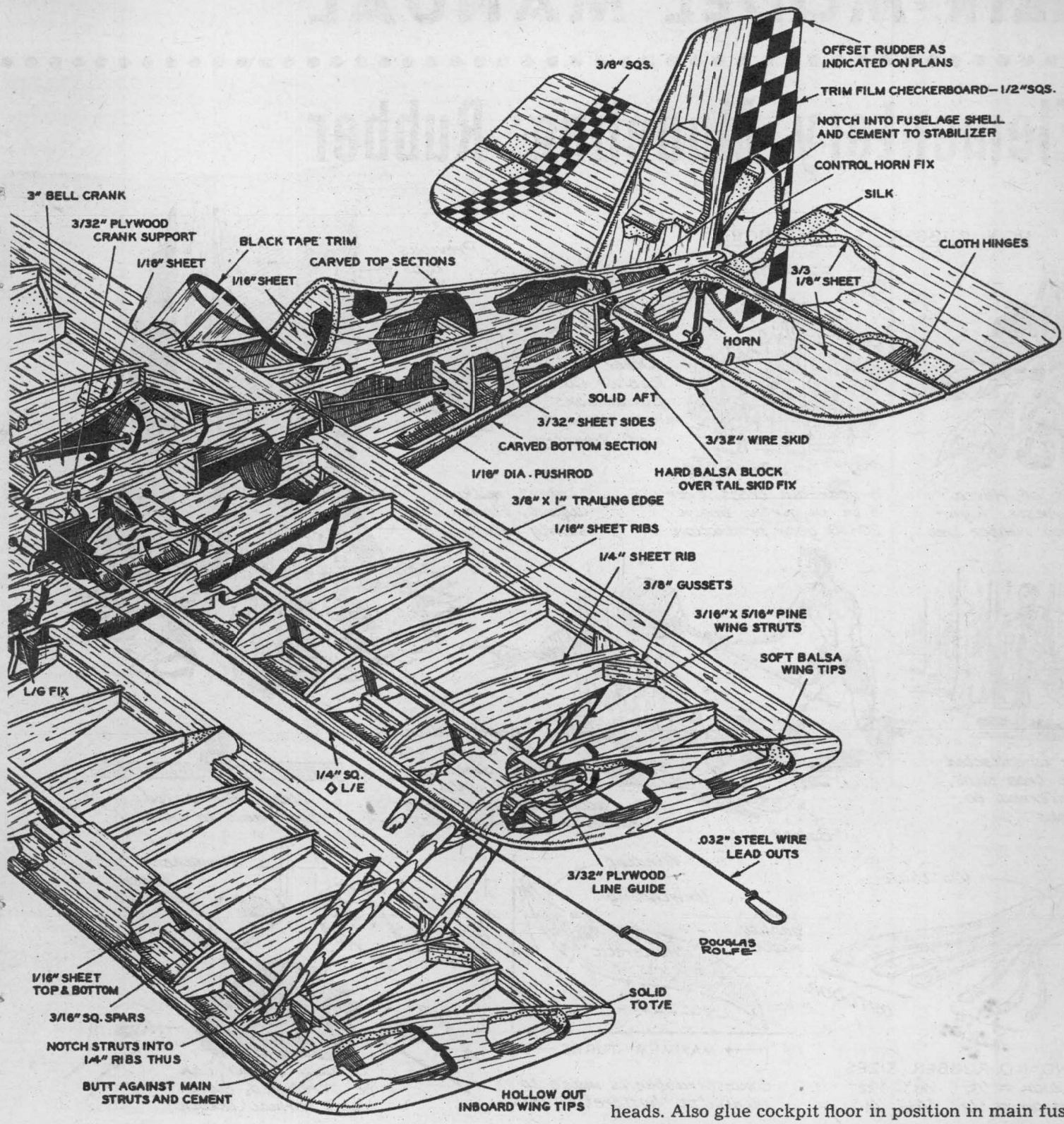
Start motor mount assembly by cutting two 3/32" plywood bulkheads as shown in the shaded area on #1 and #2 bulkheads. Slide these in place in back of the balsa bulkheads and line the holes so that motor mounts can be slipped in from front. Fit lower block to these plywood bulkheads so it can be assembled easily, then glue motor mounts and bulkheads in position, still leaving the lower balsa block loose.

Next install the tank above motor mounts. The



original *Double Whammy* had a rectangular tank with swivel suction line and air vents pointing to inside of the circle, but each stunt fan has his own particular fuel tank and there is plenty of room for anything. Extend the vent with pieces of Neoprene tube so they will come out of the sides or top and extend the fuel suction lines through the firewall. Glue in the 3/32" plywood bellcrank support in contact with the #2 bulkhead for added strength.

Make up the elevator and stabilizer assembly and control horn. Cut ends of elevator to fit the control horn extension, glue in place and wrap a strip of silk around the wire to hold securely to elevator. Slip this complete assembly into fuselage and glue in place. Bend the tail skid with a loop at front end to anchor inside fuselage, and insert through the lower carved



block. Fit a block of hard balsa over the top of the wire and glue in place. Glue both lower blocks in position on the fuselage assembly.

Insert the bellcrank, pushrod and control lead-out wire, working from top of fuselage. Keep pushrod in a straight line, otherwise the 1/16" wire will buckle when doing loops.

Next step is to fit upper sections of bulkheads (stations 1, 2, 3 and 4) into the upper carved blocks and glue in position so they will match center bulkheads. Also glue cockpit floor in position in main fuselage assembly. Glue the top blocks in position and sand the finished assembly.

The engine cowling is made by gluing up 1" thick blocks as shown in the small perspective sketch. This arrangement gives a stronger grain structure than using one piece for the cowling. Spot-glue this assembly to fuselage and carve roughly to shape, leaving excess material around spinner to be finished later. Remove cowl and hollow out, then add 1/16" plywood reinforcement to the front and rear as shown in plans and install dowel pins in fuselage to line up with holes drilled in the cowl.

Double Whammy

Mount the engine in position as shown, making sure to incorporate the 3½ deg. offset according to the top view. Put cowl back in place after cutting necessary clearance, and assemble the spinner so the front section can be carved to blend in. Finish sanding the cowl to match fuselage, then cut air intake, exhaust slot, and a hole for the needle valve.

With sanding complete, cover front section of fuselage with silk to act as reinforcement in the area marked in plans. The fuselage assembly can be painted with primer or covered with light paper and primed according to the finishing process used.

Attach lower wing and landing gear. This procedure must be followed carefully to avoid trouble. Cut two small slots in the bottom of the fuselage so that the front section of the landing gear can be inserted in the lower wing cut-out slipped forward to contact the firewall. Assemble to firewall with "J" bolts. Cut a slot in top sheeting of lower wing so it can be slid over #2 bulkhead, and then fit to fuselage and glue in place.

This leaves the #2 plywood bulkhead extending down into center of wing where rear section of landing gear can be bolted in place. Install this part of the gear and bind to the front section with soft iron wire. After tightening all "J" bolts, cover rear section of the lower wing with 1/16" balsa sheet around the landing gear and cover both wings with heavy paper.

Cut a slot into top of fuselage with a thin knife and insert rudder, gluing it against stabilizer. Attach rear section of rudder with plenty of offset as indicated in plans, then sand and cover with paper or primer. The assembled airplane and upper wing should be painted with the final color coat. Fit top wing against fuselage and glue in place at the center section, making sure it is parallel and equally spaced from the lower wing.

Cut the struts from a thin piece of pine box wood to size shown on the plans as "true length." When glue on

upper wing is completely dry, cut rectangular holes in the ¼" ribs at points shown on the wing plan, then spring the wings apart slightly and slip the struts in place. Check for correct length and trim if necessary to keep the wings parallel, then glue.

Add the plywood line guide to inboard struts and touch up with paint at all the exposed glue joints. The original *Double Whammy* is red with ½" square checkerboard Trim Film on the wings and ⅜" square checkerboard on the tail surfaces. The stripe on fuselage is black Trim Film. Glue the plastic windshield in place and trim with two pieces of black tape.

Before attempting any flights, make a careful check of the balance point. If your model balances to the rear of the point shown on the plans, add lead to the nose of the ship to restore correct balance. Fly on .012 diameter steel lines 55 to 60 feet long. Good results were obtained with a Fox .35 engine using a 9/6 Top Flite prop and Power Mist fuel. A slight under camber was carved on the back surface of the prop.

The original *Double Whammy* weighs 35 ounces (about 5 ounces too much), but will do 8 or 10 consecutive vertical 8's without any trouble. This ship is very steady in flight when balanced properly and makes perfect landings with the short sturdy landing gear and large wheels. In spite of the excessive weight the model would hold the lines very well during tight overhead 8's with engine and rudder offset as shown.

Bill of Materials

5 pcs. 1/16" x 3" x 36" medium balsa. 2 pcs. 3/32" x 3" x 36" soft balsa. 2 pcs. ⅛" x 3" x 36" soft balsa, hard on one edge. 1 pc. ¼" x 1" x 36" hard balsa. 4 pcs. 3/16" sq. x 36" hard balsa. 2 pcs. 1" x 3" x 36" soft balsa or large block. 2 pcs. ⅜" x 1" x 36" medium balsa. 1 pc. 1/16" plywood, 6" x 6". 1 pc. 3/32" plywood 3" x 6". 2 pcs. ⅜" x ½" maple motor mounts, 6" long. 1 pc. 1/16" dia. wire. 1 pc. 3/32" dia. wire. 1 pc. 1/16" maple dowel, 2" long. 1 pc. silk, 12" square. Bellcrank. 2" dia. spinner. Pine box wood for struts. Light and heavy paper. Dope. Trim Film. 2¼" Veco wheels. 9/6" propeller.

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