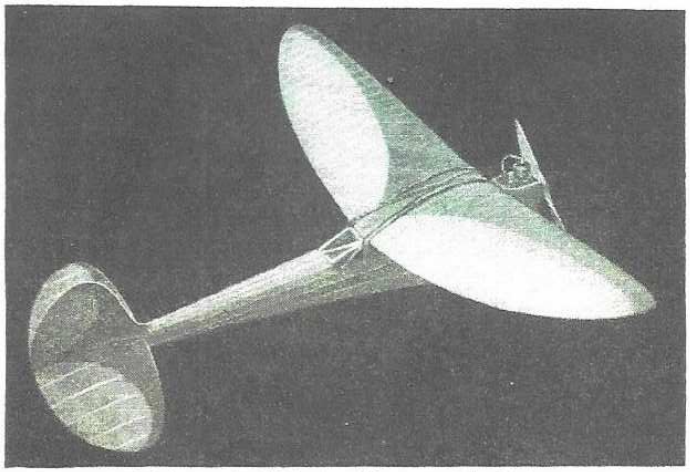
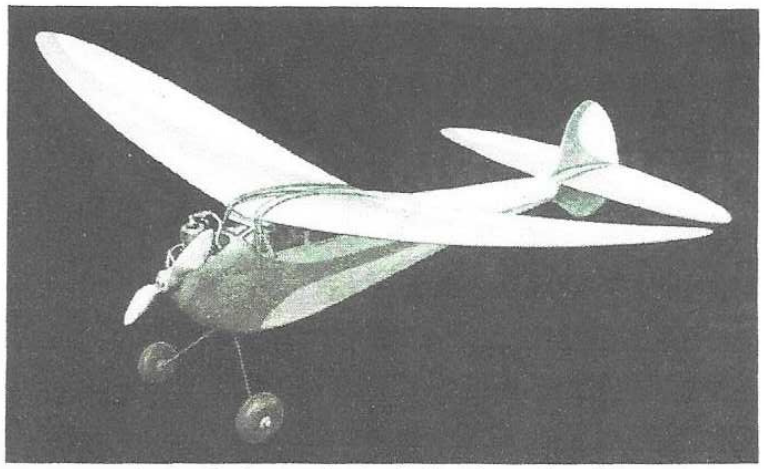


Light and efficient with a rapid climb



A simple but perfectly designed soaring ship

The "ANSWER" For Gas Fans

Build This Dual Purpose National Record Holder— It Can Be Flown in Either Class A or B Contests

By GORDON MURRAY

THERE are many questions in the mind of every potential builder of a Class A or B gas model. How big shall his ship be? Which class will it fall under? What airfoil shall be used? Shall it be streamlined?

The questions could go on for a fortnight, but in these paragraphs we present "THE ANSWER" . . . which will give the perplexed builder a solution to his many problems in one of the most consistent, best performing little planes in the gas model field today.

When the 1940 gas model rules were announced by the Academy of Model Aeronautics they gave a definite "break" to the Class A builder in that they erased the limitation on wing area. Therefore, it was theoretically possible for a builder to construct a plane for EITHER Class A or B, the simple change of a motor making the ship available in either class. In "The Answer" the builder will find such a ship . . . use an engine of 0 to 1.99 cu. in. displacement in Class A or a .20 to .30 cu. in. displacement engine in Class B and be a winner in either class.

Performance? The first day "The Answer" was flown it gave evidence of superior performance. It was entered in the Class A-B meet of the Metropolitan Model Airplane Council and despite the lack of thermals the little ship turned in an average of 1:50 to take top honors in its class, and incidentally to establish a Class A 1940 record that still stands. Under daily flying conditions, with better weather, it has several times done over five minutes.

The design of the ship has proven extremely adaptable to various classes. When "scaled up" 1½ times The Answer proved to be fully as fine a performer as a Class C ship, establishing an officially-timed average of 8:36 with a Dennymite. The record has been forwarded to the AMA for certification.

Building "The Answer"

First, the plans must be "scaled up" to actual size. All plans on Plate 1 have been drawn quarter-scale so the builder must enlarge these plans four times. The model builder with plenty of cash may use expensive drawing paper for this, but the plans done on a sheet of brown paper (from the butcher shop) are just as workable and usually do not adhere so closely to the cement used. The wing and tail are elliptical in shape. The standard method of laying out an ellipse may be used, or the 1" squares may be drawn and the builder may then form the outline by following Plate 1.

The Wing

The wing used on The Answer is conceded to be the secret of the entire ship: It combines high lift with a maximum of efficiency. Say what you will, it has been proved to the satisfaction of the most critical builder that this wing really "has the stuff." Once you've built one, you too will be intrigued with the possibilities and will probably be trying this type of wing on other models.

The construction of the wing is shown on plate 3, and is really very simple. The first step is to cut the outline from soft quarter-inch sheet balsa. Four sheets, 2 inches wide and 30" long will suffice for this step. You will note that the leading and trailing edges are in one piece, joints coming at the tip and at the center section.

Cement the sections together and let dry thoroughly. Next cut wing rib tem-

(Continued on page 50)

The ship in flight shows great stability

The author and the plane with sparless wings

The "Answer" for Gas Fans

(Continued from page 15)

plates from the pattern on Plate 2. These may be cut from any scrap sheets but should be at least 1/8" thick. Place one of these at the center section, another nine inches out on the wing and another four inches from the tip. This step is shown clearly on Plate 3. The one-third/two-third line on the template is matched with the corresponding line on the wing plan, and these templates are pinned in position over the plan.

To achieve best results next soak the wing outline in hot water and bend it over the jig, using pins and cement to hold it in shape. Although the wing templates will not be used in the finished wing, cement the wing to them in the forming step. They may be easily removed later. The assembly should be allowed to dry thoroughly.

The wing ribs are cut from 1/16" medium sheet balsa using a wing rib template cut from 1/16" plywood to form both the top and bottom curves. On the sheet of 1/16" balsa from which you are cutting the ribs, draw a vertical line about 3 inches from the end of the sheet. Place the template on the balsa sheet, matching the one-third/two-third line on the template with the line you have already drawn. Cut the top curve of the rib, move the template down 1/4" and cut the bottom curve. Move template down another 1/4" and cut another rib. This process is repeated until all 36 ribs are cut.

Place the ribs on top of the outline, upside down, making sure that the one-third/two-third line corresponds to that on the plans. Hold each rib in place and cut off at the leading and trailing edges until it is of proper size. Turn the rib over and cement into place. This process is carried out for the entire wing.

Repeat the entire process to complete the other half of the wing. When both halves are complete, they should be joined. Bevel these halves at the center section to form 3 inches of dihedral at each tip. Cement this joint thoroughly, applying several coats.

Sand the leading and trailing edges to a streamline shape as shown on the typical wing section, Plate 1. Cover the center joint with a strip of 1" gauze, top and bottom and cement thoroughly.

As a final step, cement one of the wing rib templates at the intersection of the two halves on the bottom, to act as a stiffener. Trim this section on the bottom as shown on the lateral view of the fuselage.

Cover the bottom of the wing first with light bamboo paper using cement as an adhesive. Be sure to cement the paper to each rib. In covering the top it is only necessary to apply cement sparingly to the leading and trailing edges. Water dope the entire wing when covered and after drying apply three coats of dope to the wing, top and bottom. You will find that the wing warps up slightly. From this point on keep doping the TOP of the wing giving it sufficient coats until it warps up giving a dihedral of 5" on each tip.

The Fuselage

In building the fuselage, construct both sides over the plans. Note that 3/16" square medium balsa is used for longerons and uprights, except where noted. See plate 2 for construction of the motor mount. The motor mount bearers are of pine, cemented directly to the top longeron and are made with each side as an integral piece of the construction. When the two sides are completed, invert the sides on the top view of the plan and cement the cross braces in place. Cut the bottom cross braces and complete the bottom of the ship to the dimensions shown on the bottom view. The formers are shown in full size on plate 3. These should now be cemented in place. The cabin, of 3/16" square balsa, is now built on the fuselage and when this is completed the 1/8" square stringers are cemented in place from the cabin top to the tail, as shown.

The construction of the nose is shown on plate 2. Note the position of the two firewalls. The first one is of 2-ply (two layers) of 1/16" sheet balsa. The second, which supports the landing gear, is of 1/8" birch plywood. The sides of the nose, which are of 3/16" soft sheet, cement to the motor bearer and the first of the two firewalls. Between the sides of the nose, cement a block of soft balsa. Cut this piece inside to accommodate the depth of the motor used. When this assembly is thoroughly dry, "butcher" the assembly until it conforms to the outlines of the nose shown on the plans. A sand block (a piece of 2"x3" wood with sandpaper wrapped around it) may be used in this "butchering" process. After sanding to outline cover with several coats of cement, sanding between coats until a smooth finish is obtained. The landing gear, of 3/32" wire, is bound and cemented to the second firewall.

The underslung, which is really a continuation of the rudder, is made with the fuselage. Formers 7 and 8 are cemented in position and the curve section, of 1/8" sheet balsa is cemented in place. Be sure this assembly "lines up" with the rest of the construction. Sand the entire fuselage down before covering. The underslung, of course, should be sanded to airfoil edge.

Cover the fuselage with silk, which should be wet before application and applied when still damp. Apply the silk first, then cement to the longerons. The cement goes through the pores of the silk and adheres to the wood. When dry, give the fuselage 5 to 8 coats of clear dope before painting. The dowels of 1/8" birch may be inserted after the covering has been completed, being cemented as shown.

Tail Assembly

The trailing edge is cut from 1/4" soft sheet balsa. It is placed over the plans and pinned in position. The leading edge of 3/16" square hard balsa should be soaked in water and pinned in position. The spar and ribs, of 1/8" by 1/2", are then cut and inserted as shown on the plans. Cement securely at all points and when dry use a pen-knife or sand-block to cut the ribs down to meet the leading and trailing edges, which are sanded to airfoil section.

The rudder outline is cut from soft 1/4" sheet balsa. Ribs and spar are of 1/4" by 1/8" stock. When the assembly has been completed sand to airfoil section.

Cover the elevator and rudder separately, with light bamboo paper. When each unit is covered, water dope, let dry and give several coats of clear dope. It is best to complete the painting of this assembly before cementing the rudder to the stabilizer.

Motor Mounts

The motor mounts proper are bolted to the inside of the motor bearers. Note that only one bolt is used for each, this being sufficient for Class A or B motors. Holes are drilled to fit the motor used. The nuts for the bolts which hold the motor are cemented to the bottom of the mounts to aid in removing the motor at a later date. The mounts are shown inserted.

Wiring

The position of the battery box, timer and coil are shown in the fuselage by dotted lines. Any standard wiring diagram may be used.

Adjustments

The plane, when completely assembled, will balance at forty to fifty per cent behind the leading edge, depending upon the motor used.

Test glide the ship on a calm day. Be sure and point the nose slightly down when gliding, otherwise it may go up

from the hand, stall and dive in. If the ship dives, insert pieces of 1/16" sheet balsa under the trailing edge of the stabilizer. If it stalls put the balsa pieces under the leading edge of the stabilizer. Do not make adjustments on the wing.

Additional adjustment, tried successfully, is to "wash in" the left wing and give the ship left rudder. The wing may be "washed in" by steaming the assembly after completing.

Properly adjusted the ship should show a flat, slow glide slightly toward the left. When you feel these adjustments have been made, a flight under power may be tried.

Flying

Here's a bit of advice. Don't open up the motor on the first flight. Give the ship a 20 second motor run under low power and watch that first trip "upstairs." The ship should circle to the left both under power and in the glide. This eliminates that dip when the motor cuts and saves valuable feet of altitude gained on the motor run.

You'll find the ship rugged, dependable and "The Answer" to your demands of a small ship. Fly it until you are familiar with every adjustment and it will "clean up" in any contest. It's just what we wanted it to be.—"The Answer."