GAS MODEL ARMY SCOUT

A scale model of the Curtiss 0-52 observation plane that is easy to build-and a most consistent filer

by SYDNEY STRUHL

THIS month we are presenting a most unusual gas model - a truly scale version for either Class A or Class B motors of the United States Army's new eyes: The Curtiss 0-52 observation ship.

The Curtiss 0-52 is the Army's latest flying "greenhouse" used extensively for observation and reconnaissance work, artillery spotting, and on photographic missions. The crew consists of two: the pilot and observer. Naturally the ship's performance and other details are Army secrets, but it is said the 0-52 is considered one of the most efficient aircraft of its type in the world.

After glancing at the pictures of the Curtiss 0-52 you can readily tell that this type of plane would make the ideal scale gas model. And believe us it does!

The general setup of the whole plan lends itself to a very stable model. The high wing, ample dihedral, large tail surface area, well placed thrust line, and a rather nice setup of all forces such as the center of gravity and center of lateral area, etc., all combine to present a very pleasing picture of what the well-flying gas model is sporting this year.

Certain structural features are well-noted, too. The landing gear placed well forward insures fine landings and prevents broken propellers. The fuselage design allows us to employ the well known "crutch construction" that simplifies fuselage construction to a great degree.

The 0-52's construction may appear rather difficult at first glance, but after a little study of the plans you will realize that this model is amazingly easy to build. We have tried to keep construction easy enough for the beginner who is trying leis hand at a gas model for the first time.

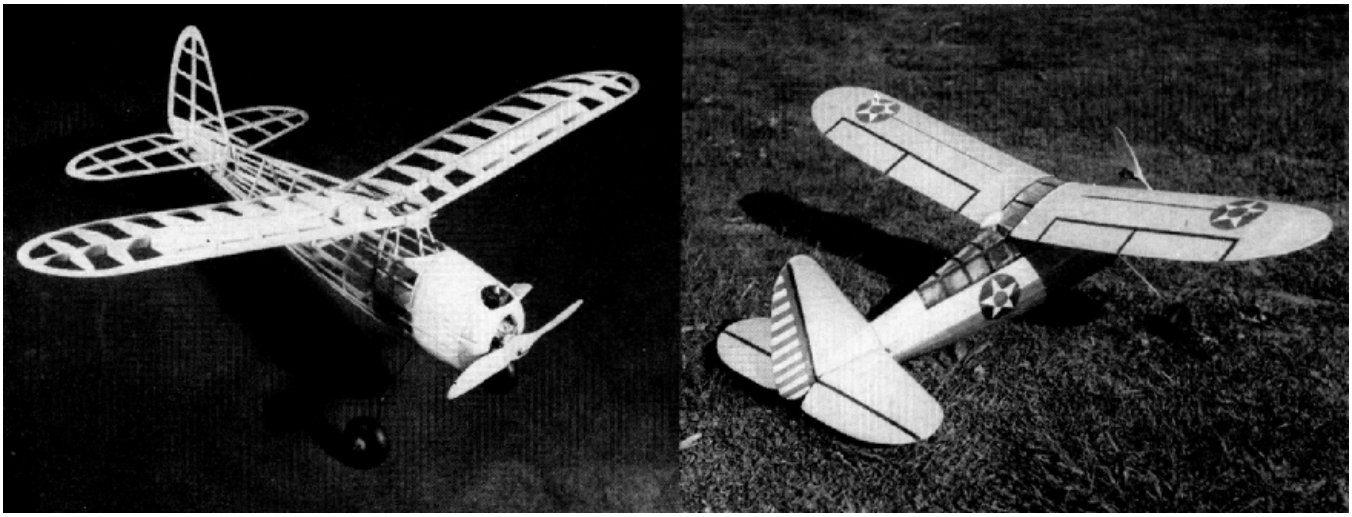
Of course one of the big features of our Curtiss scale gas model is the fact that we are employing the new Grant wing slots. There are several reasons why we decided to use these new slots in the wings. The model has a rather high wing loading which means that flights will be quite fast: naturally you don't want a sensitive model: therefore the wing slots. Although the tail surfaces were designed with plenty of area, the fuselage moment arm is rather short. When the wing slots are used they eliminate the need for a long moment to produce a stable flying model. Slots also go a long way in producing a long, flat and very slow glide. All of these facts and claims about wing slots have been proved by the designer, the editor of Model Airplane News, Mr. Charles H. Grant.

The model is large enough to take either a large Class A or B motor. The author used an Ohlsson 19 to power his 0-52 and there was enough power to pull his model quite high on a twenty second motor run. Evidence of the flying ability of the model is that although it was always flown just before sundown when most of the thermals had died down, flights of several minutes were common and are now taken as customary.

The author has tried to adhere to true scale throughout and only very minor changes were made to insure stable flights. It is suggested that you fly without the single wing strut shown in the front view; the extra drag is not compensated by the appearance. If you wish to use the strut use dress snaps to keep it in place.

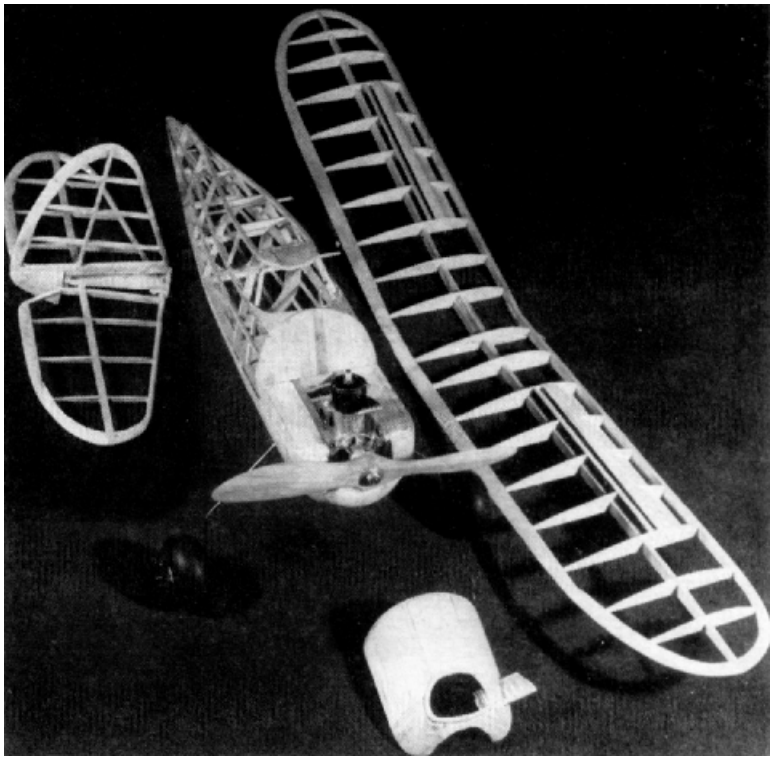
You will note that the plans are drawn to a very convenient scale of 1/3" to the inch. Therefore all you have to do to obtain full size drawings is to enlarge the magazine plans three times. Too make your task still easier we have supplied full size drawings of the fuselage bulkheads, wing ribs, tips and other important parts.

Well, that's enough talk about the Curtiss O-52. Now how about buckling down and see just how fine a job *you* can make of it?



It is not only realistic, with its gas engine and scale proportions, but wing slots make it one of the most reliable performers ever built. These features combined with simple sturdy construction provide many flying hours without crackups

Just like the full scale plane when properly decorated



Plane is composed of separate units which are conveniently detachable, facilitating transportation

FUSELAGE - The fuselage is constructed with the use of a main crutch and a sub-crutch. The main crutch is shown in the fuselage top view. This is made from 1/4" sq. strips of balsa. Note that the hardwood motor mounts are attached to the main crutch. Fill in around the motor mounts with 1/4" soft sheet balsa. While cement is drying on the main crutch make the sub-crutch. This is made from 1/8" x 1/4" strips and cemented firmly together. Cut the piece S-C from 1/4" sheet and cement to the front of the sub-crutch.

Now connect sub-crutch to main crutch as shown in the fuselage sketches with 1/8" x 1/4" uprights. Be sure to keep dimensions correct as given in the side view. Finish the top of the fuselage as shown. Lay the two 1/8" square fairing stringers on each side of the fuselage as shown. Cut all fuselage bulkheads as given in Plate 3 and cement them all in their proper locations.

Bend the single-strut landing gear strut from 3/32" steel music wire to design shown and attach it to a 1/16" thick piece of plywood cut to the shape of lower section of bulkhead D. Cement this to the bulkhead with several coats of cement. Add the lower 1/8" square stringers to the bulkheads. Note that the very bottom stringer is 1/8" x 1/4" rather than 1/8" square. Attach a small tail wheel to the 1/8" x 1/4" stringer with several coats of cement and bind with thread.

Fill in between bulkheads C and D with 1/8" soft sheet balsa. Note that bulkhead D' is not cemented to D; and sandpaper perfectly smooth to simulate the cowling. Insert lengths of 1/8" hardwood dowl to wrap rubber strands on to keep the wing and tail section in place. Cut all necessary holes in the cowling to accommodate your individual motor. No battery box and coil position is given in the plans because these are placed along the main fuselage crutch at points that will balance the model at about the 50% wing chord mark. Note that bulkhead J' is cemented to the center section of the wing and not to the fuselage; this forms the fuselage fairing into the wing.

Cut the stringers between D and D' and along the top of the main crutch through A, B and C to obtain the removable cowling. Each individual motor requires different holes for adjustments and cooling.

WING - The wing is constructed in one piece. You should experience no difficulty in making the wing for it is of the simplest construction.

As was mentioned above we employ the Grant type wing slots. Heretofore this type of wing slot was constructed by the complicated sheet-box method which many builders found difficult to make. Our method is much simpler, we merely use two pieces of sheet balsa of the necessary thickness and carve the required crossection in them. Cover the wing in the usual manner; cut the covering away from the slot openings on the top and bottom of the wings and presto, the slots are finished. Simple?

It is wise to construct the wing over a full size drawing of the wing plan. All dimensions are given on Plate 2. Cut the required number of each rib pattern from medium hard 1/16" sheet balsa. Note that the ribs accommodating the wing slot are made in two pieces.

Since the airfoil used is of the flat bottom type (modified Clark Y for ease of installing the wing slot) all members may be pinned directly on the plans. Naturally you will have to block up the leading edge to meet the rib leading edge. Insert all ribs and cement firmly. Cut wing tips from 1/4" sheet to patterns - given full size in the plans - and install in their proper locations. Carve the wing slot members to required crossection as described above and cement in place, making sure you get an even, smooth contour on the wing surfaces. If there are any bumps, shave and sandpaper them off, otherwise you will spoil the efficiency of the wing airfoil.

Now install the necessary dihedral in each wing tip, noting that there is a flat center section that fits onto the fuselage sub-crutch. Cheek for any warps in the wing; recement all joints: it might be a good idea to re-enforce the dihedral joint with gussets and other balsa members. Use loads of cement at this section.

The real ship has a single strut to brace the wing. The author found there was a great difference in performance with and without the strut, so he recommends that it be left off because it isn't needed for strength. If you prefer to use it. details may be found in the front view drawing.

TAIL SURFACES - Tail surfaces are very simple to construct and no difficulty should be found here.

Pin all members directly on full size rudder and stabilizer drawings. Cut the tips from the full size patterns given in the plans and cement in place. Cut the tail block from 1/4" sheet and note it is cemented to the bottom of the rudder and not to the fuselage.

Send a slight airfoil section into the tail surfaces. Assemble the tail group as follows: cut the small section from the fuselage rear as shown in the plans; cement stabilizer to the very bottom of this section so that there is 0° incidence, using the thrust line as a base line. Now cement the rudder into position onto the top of the fuselage section. Add 1/8" hardwood dowls to wrap the rubber strands upon in the proper positions.

COVERING - The author covered his Curtiss 0-52 with gas type Silkspan and then doped it silver. Of course you can use any combination you want but it is suggested that you stick to some type of military coloring.

Tail and wing are covered in the usual manner. Use heavy dope as adhesive; it is necessary to dope only the extremities of these surfaces. It is best to cover the fuselage with wet Silkspan since it is much easier to apply this to the compound curves of the fuselage when it is wet.

Spray the entire covering with water to tighten the covering. Now brush on two or three coats of clear dope. Sand any fuzz with 10-O sandpaper before applying color dope. The author brushed three coats of very thin silver dope, about the consistency of water. This was just enough to give it a solid coloring without adding unnecessary weight.

Control surfaces are shown by strips of black paper doped to the correct positions. Add official U. S. Army insignia which can be purchased at your local model store. The cowling may be painted a contrasting color such as blue or red. Outline the window, with strips of black paper doped to the celluloid cabin.

FLYING-Testing the Curtiss 0-52 model should be comparatively easy if you take the necessary precautions and show a little care because it really is a very stable ship.

With the incidence required in its proper location and the model free from warps, the ship is glided into the wind, preferably over tall grass. If your model is on the heavy side, remember it will require a stronger heave to make it reach flying speed. It should be test-glided until it glides far and flat.

Keep test-gliding until proper glide is obtained, adjusting the rudder so the ship turns to the right in the glide in a large shallow circle.

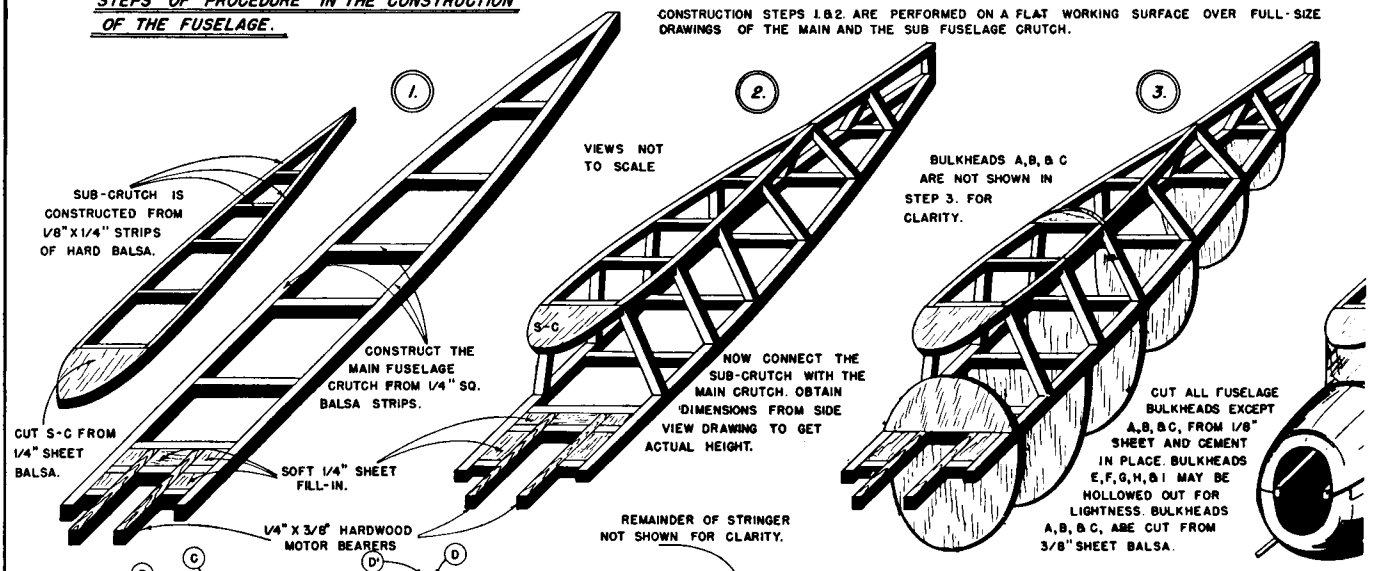
You are now ready to test your model under power. Use short motor runs and gradually increase the motor speed on each succeeding flight until you have all the "bugs ironed out." Note how the model behaves, which way it turns under power, climbing angle, glide, and its direction - - and of course make all necessary corrections.

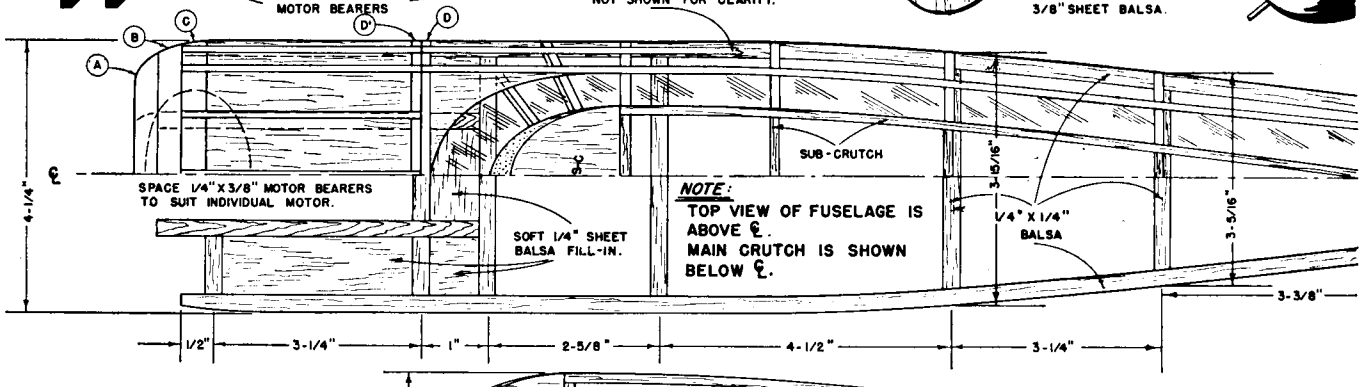
With the above adjustments the model should jump from the ground or from your hand a few feet forward, gathering lots of flying speed, and then zoom for the sky in a left or right banking attitude until the motor cuts off; then it should roll out into its excellent glide.

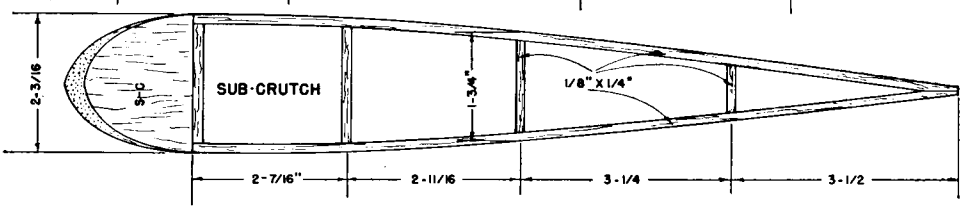
We have tried to present you with as simple a picture of building the scale Curtiss 0-52 as possible and hope that it meets with your approval. If there is some point not quite clear, don't hesitate to write the author, care of this magazine, stating your individual problem; enclose a self-addressed stamped envelope.

STEPS OF PROCEDURE IN THE CONSTRUCTION OF THE FUSELAGE.

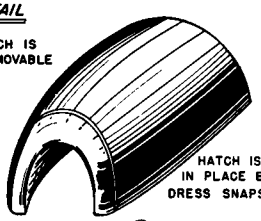
CONSTRUCTION STEPS 1 & 2. ARE PERFORMED ON A FLAT WORKING SURFACE OVER FULL-SIZE DRAWINGS OF THE MAIN AND THE SUB FUSELAGE CRUTCH.

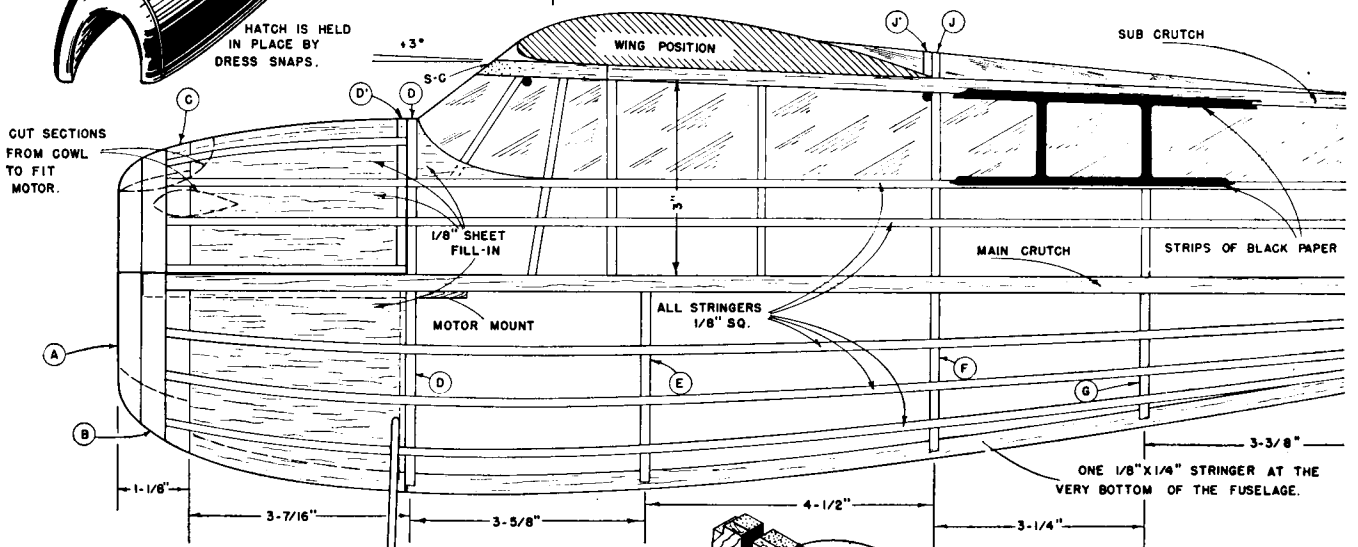






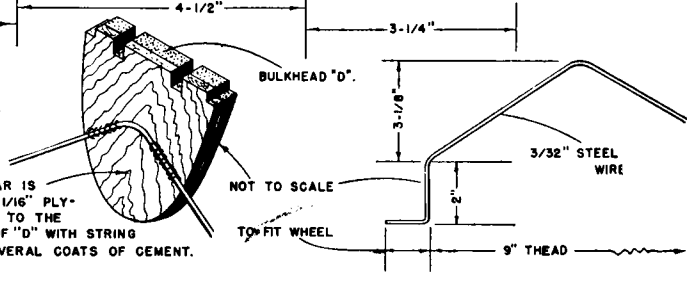
COWL HATCH DETAIL



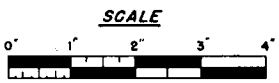


ANY MOTOR OF .19 TO .29 CU. IN. DISPLACEMENT MAY BE USED IN THIS MODEL OF THE CURTISS O-52.

LANDING GEAR DETAIL

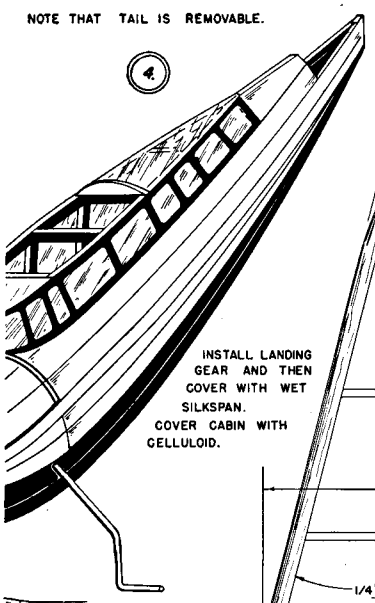


SCALE

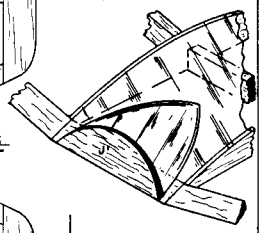


BUILD THE STABILIZER IN ONE PIECE.

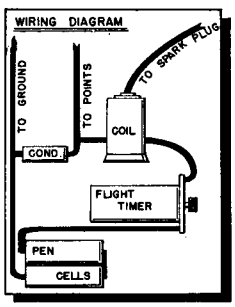
NOTE THAT TAIL IS REMOVABLE.



INSTALL LANDING GEAR AND THEN COVER WITH WET SILKSPAN. COVER CABIN WITH CELLULOID.

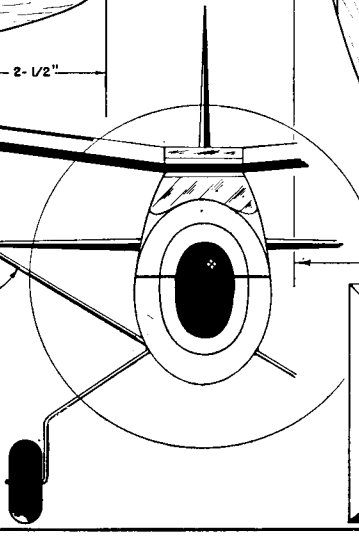


VIEW SHOWING HOW BULKHEAD (J) IS USED TO FAIR THE CELLULOID CENTER SECTION INTO THE FUSELAGE CABIN.



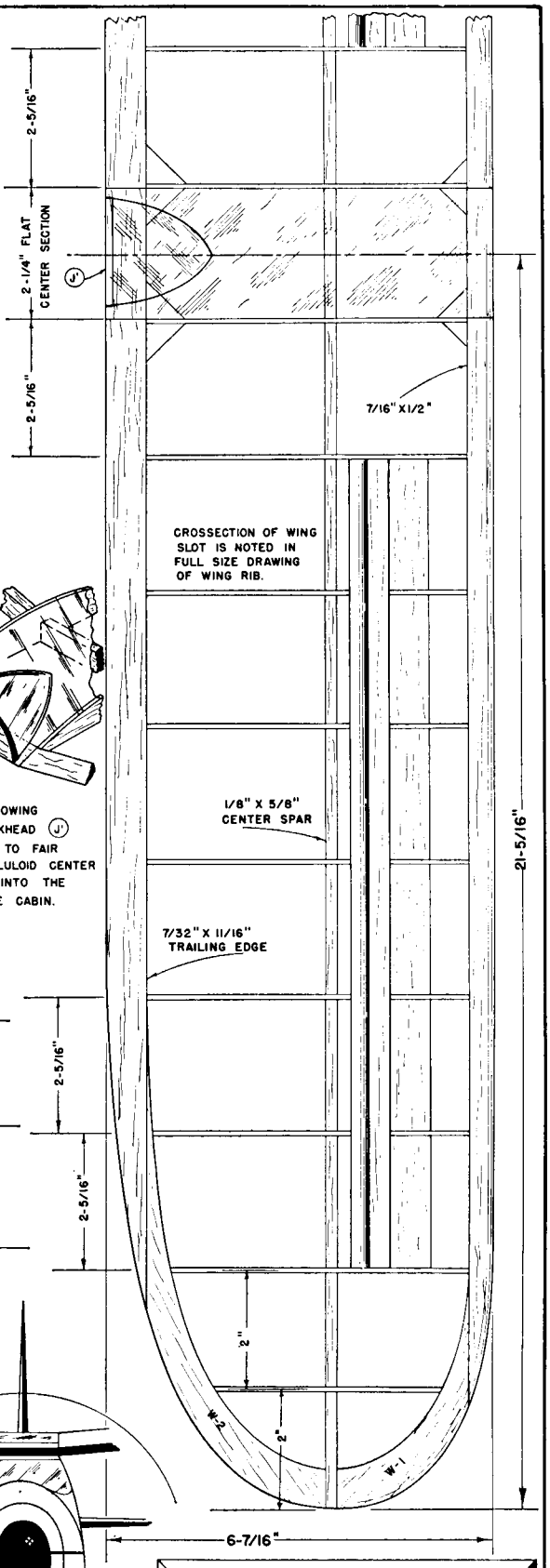
3" DIHEDRAL AT EACH WING TIP.

A SINGLE STRUT 13" LONG IS USED FOR SCALE PURPOSE ONLY. NOT ADVISABLE TO USE STRUT ON FLYING VERSION.



FRONT VIEW

ONE-HALF DESIGNATED SCALE



LOCATE COIL AND BATT. BOX IN THE FUSELAGE TO BALANCE THE MODEL

"CURTISS O-52"

BY SYDNEY R. STRUHL

SCALE -- PLATE 1 & 2., 1/3"=1" PLATE 3 & 4., 1"=1".

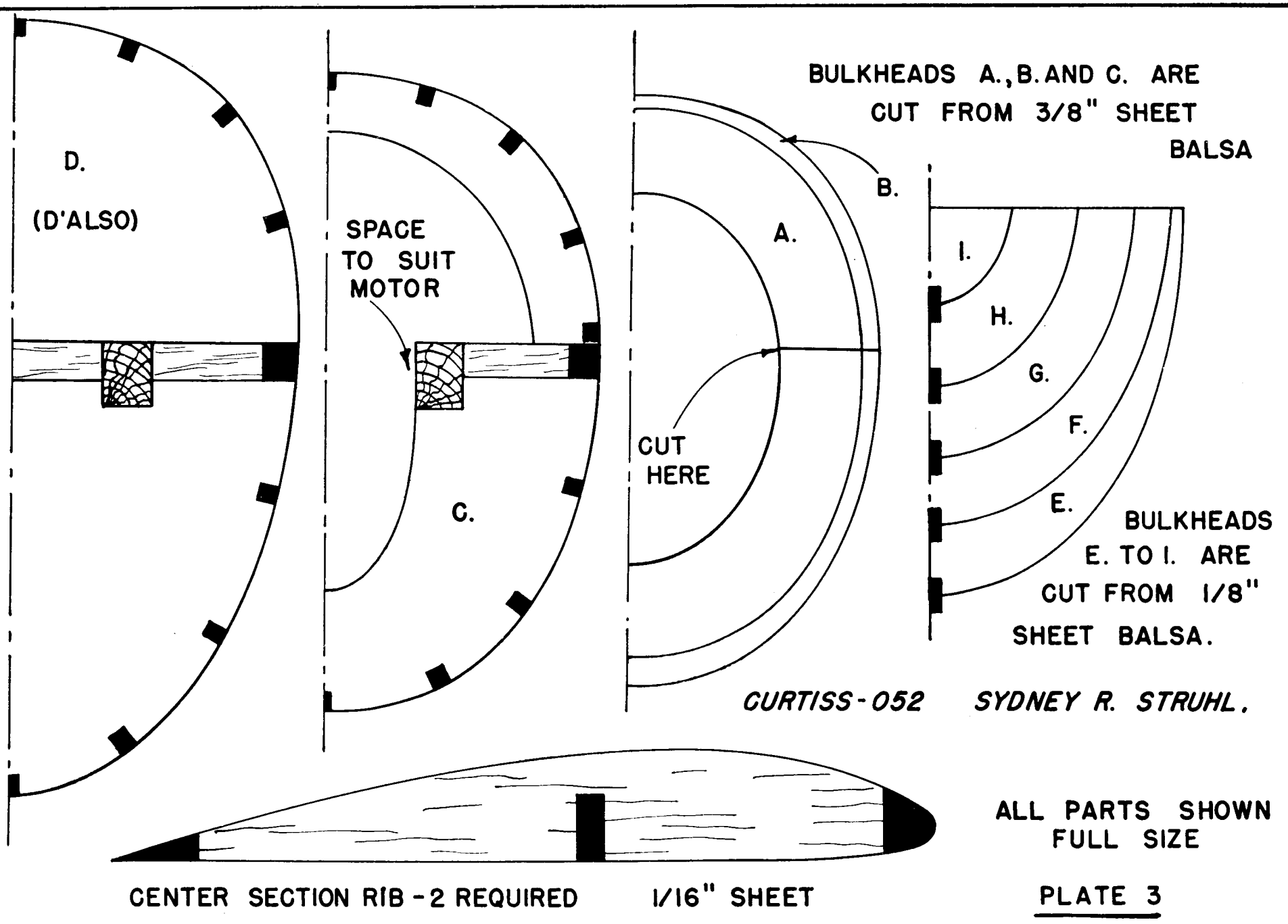
WING SPAN ---------- 42-5/8"

LENGTH OVERALL ---------- 30-1/2"

MOTOR ---------- CLASS 'A' OR 'B'

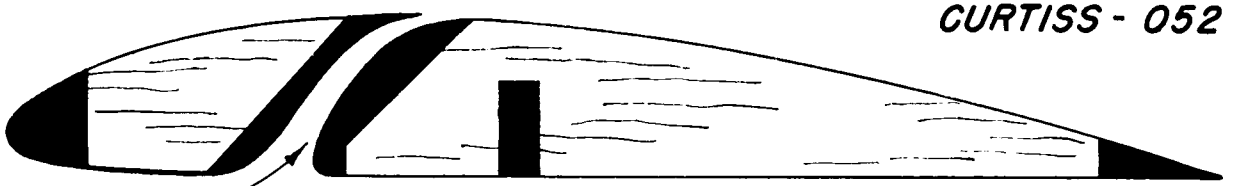
PROPELLER DIAMETER ---------- 9"

PLATES 1. & 2.


D.
(D'ALSO)
SPACE
TO SUIT
MOTOR
C.
A.
B.
CUT
HERE
I.
H.
G.
F.
E.
BULKHEADS A., B. AND C. ARE
CUT FROM 3/8" SHEET
BALSA
BULKHEADS
E. TO I. ARE
CUT FROM 1/8"
SHEET BALSA.
CURTISS-052 SYDNEY R. STRUHL.
CENTER SECTION RIB - 2 REQUIRED 1/16" SHEET
ALL PARTS SHOWN
FULL SIZE
PLATE 3

CURTISS - 052

SYDNEY R. STRUHL.



WING SLOT

WING RIB - 14 REQUIRED 1/16" SHEET

WING TIP RIB - 2REQUIRED 1/16"

J & J'

TWO REQUIRED
1/8" SHEET

S-1 3/16" 2RD.

S-C
1/4" SHEET
1 RD.

ALL PARTS ON THIS PLATE ARE SHOWN FULL SIZE

TAIL BLOCK
1/4" SHEET
1 RD.

S-2 3/16" 2 RD.

W-2 1/4" 2 RD.

R1
1 RD.
3/16"

W-1 1/4" 2 RD.

R-2 3/16" 1 RD.

PLATE 4