



**Designed By Joe Bridi**

**Photos - Text by Ben Strasser**

**E**ach time we do a construction article for RCM, we try to keep the words down to the bare bones by sticking mainly to the building sequence. Somehow, it seldom works out that way though. It seems that with each aircraft there are some cautions to point out along with special ways of assembling different parts that will make it go together better. And each special idea takes a few more words. Ah well, we keep trying.

The Rearwin Speedster Model 6000 is a new Bridibird designed by the man for the experienced R/C pilots among us who are interested in the 1/4 scale scene. A sturdy design that will eat up your MonoKote, Solarfilm, or Coverite faster than the 454 engine in my pickup truck eats gas on the trip to the flying field; the airplane can be flown with a Quadra, .80, or .60 with a prop reduction unit. To help out your construction, RCM is making the epoxy-glass cowl, wheel pants, and dural landing gear available.

#### **Building The Stabilizer, Elevator Halves, Fin, and Rudder**

We'll begin construction with the tail feathers because they go together quickly and don't require much in the way of special comments. The only caution we want to mention is that the leading edge of the fin extends into the fin plate on the top of the fuselage at the tail. Also, the fin tail post extends to the bottom of the tail of the fuselage. Finish the building job by cutting the necessary hinge slots and adding the control horn insert. Easy, huh?

#### **Preparing To Build The Wing**

Next, the wing, especially since it must be built to finish the fuselage. Here are the preparations to be made. Use the template provided on the plans to draw the airfoil shape on the spar end of the center tip block. Note that the airfoil is semi-symmetrical, so mark the top of

### **REARWIN SPEEDSTER M6000M**

**Designed By : Joe Bridi**

#### **TYPE AIRCRAFT**

1/4 Size Stand-Off Scale

#### **WINGSPAN**

96 1/4 Inches

#### **WING CHORD**

14 7/8 Inches

#### **TOTAL WING AREA**

1420 Square Inches

#### **WING LOCATION**

High Wing

#### **AIRFOIL**

Semi-Symmetrical

#### **WING PLANFORM**

Constant Chord

#### **DIHEDRAL, EACH TIP**

1/2 Inch

#### **OVERALL FUSELAGE LENGTH**

69 1/2 Inches

#### **RADIO COMPARTMENT AREA**

(L) 17" x (W) 5" x (H) 6"

#### **STABILIZER SPAN**

34 Inches

#### **STABILIZER CHORD (incl. elev.)**

10 3/4 Inches (Avg.)

#### **STABILIZER AREA**

365 1/2 Sq. In.

#### **STAB AIRFOIL SECTION**

Flat

#### **STABILIZER LOCATION**

Top of Fuselage

#### **VERTICAL FIN HEIGHT**

13 Inches

#### **VERTICAL FIN WIDTH (incl. rudder)**

15" at Fuselage

#### **REC. ENGINE SIZE**

.60, .60 w/reduction unit,

1.5 or Quadra

#### **FUEL TANK SIZE**

16 Ounces

#### **LANDING GEAR**

Conventional

#### **REC. NO. OF CHANNELS**

4 (2 servos req. for ailerons)

#### **CONTROL FUNCTIONS**

Rud., Elev., Ail., Throt.

#### **BASIC MATERIALS USED IN CONSTRUCTION**

|                        |                    |
|------------------------|--------------------|
| Fuselage .....         | Balsa & Ply        |
| Wing .....             | Balsa & Ply        |
| Empennage .....        | Balsa              |
| Wt. Ready-To-Fly ..... | 200 oz. w/1.5 eng. |
| Wing Loading .....     | 20.28 Oz/Sq. Ft.   |

each piece center tip block to prevent mishaps later. Also, be sure you mark a right and left piece. Stack ribs #2-#9 (8 ribs total for each wing panel) and drill the hole for the aileron pushrod. Either 1/16" piano wire alone may be used, or the hole through the ribs can be drilled to accept an outer NyRod tube to minimize friction.

By studying the plans, you'll find that the wings are held to the hardwood spar supports on the fuselage with a 4/40 screw that passes through a clearance hole in the bottom of the front and rear spars. They screw into the threaded hardwood pieces. A square 1/16" ply plate is glued into the bottom of both spars, both to offer a hard surface for the screws and to reinforce the spars at that point, so the screws can't compress them. Relieve the spars in the location of the screw plate. Glue the square plate in place. Next, relieve all of the spars for the long ply plate so when it is added it will be flush with the surface of the spar. See the wing side view on the plans. Glue the long plate into the inboard end of each spar.

Because webbing is used along the front and back spars, we recommend preparing these pieces before the ribs are glued in place. Also, the ply plates used in the first bay and the webbing pieces should be cut so they stop about 1/8" from the surface of the top and bottom spars. In that way they won't show in your covering material. By preparing these webbing and ply pieces now, they can be used as a guide when the ribs are installed to insure a snug webbing to rib fit. Number the webbing pieces for the appropriate bays — unless you've stacked sanded them to make sure they're all exactly alike. Then, use one of the hardwood spar supports to prepare a spar spacing template. Cut the piece about 1" long and the exact top

# REARWIN SPEEDSTER M6000M

to bottom width of the hardwood spar support. This template will be used when the top front and rear spars are installed to insure that they are properly spaced to accept the hardwood pieces.

To complete your preparation, select two of the ribs and number the rib #14. Using the false rib side view on the plans as a guide, mark the datum line — which is not the rib centerline because the rib is semi-symmetrical — down the length of the rib. This line will be needed later when you prepare to sand the wing tips to the desired shape.

## Building the Wing

Plans are provided for both wing panels so you can build them at the same time if you have the room to do so. With the plans covered with plastic kitchen wrap, and remembering that the bottom spars have the square ply insert, pin the front bottom spar onto the plans with the square ply insert side down. A 3/16" strip of balsa is used to block up the bottom rear spar. Use the root wing rib as a guide to assure the proper spacing of the front and rear spars. The rear spar should be angled slightly so it fits squarely into the cut-out in the wing ribs.

Using the ply pieces in the first bay and balsa webbing for the other ribs to get the proper spacing, glue the 1/4" root rib and other ribs (except the geodetic tip rib) in place. Use a carpenter's square to assure that the root rib is at 90° to your building board and to the leading and trailing edge. Then, with a piece of 1/2" balsa strip under the leading edge as a block, pin and glue the leading edge in place. Add the trailing edge, making certain it is properly aligned with the trailing edge of the ribs. Glue the top front and rear main spars in place with

the long plywood plate side down. Use the spar spacing template to get the proper spacing between the top and bottom ribs in the first bay. If necessary, it's okay for the top spars to extend a bit above the ribs to get the desired fit to the template, and to the spar support. If they do extend a bit above the top of the ribs, the spars can be sanded later as you detail sand the wing panels. Add the ply plates on both sides of the spars and triangle stock reinforcement pieces in the first bay. Add the webbing as shown on the plans.

Using the rib contour drawn on the spar end of the center tip block, pin and glue the center tip block in place to the top and bottom forward spars. When this block is properly aligned, the top and bottom spars will extend a bit above and below the block. Use scrap balsa to block up the center tip block as necessary so it is centered on those spars and is parallel to the surface of your workbench.

Add the leading edge block so it is centered on the side of rib #13 and on the rib contour drawn on the inside of the center tip block. Install the rear tip block

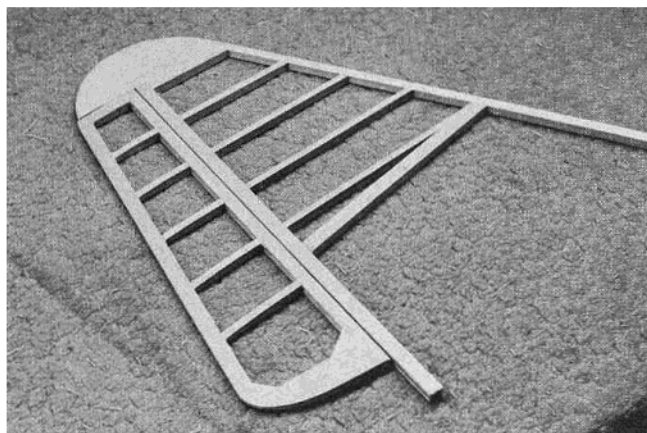
in the same way. Glue in the sub spar behind the leading edge. This spar can be bent slightly down at the tip end to glue to the leading edge block. Use the aileron as a guide to glue in the tip trailing edge block and inboard trailing edge piece. Sand the leading edge of these pieces to assure they line up properly with the wing rib contour.

When the adhesive has set up, the wing should be removed from the building board. The rear top and bottom spars are to be cut off flush with rib #14. Trim the leading edge and spars at the root rib as necessary. Add the tip geodetic rib, the bellcrank/bellcrank plate assembly, the servo mounting plate — which is glued just below the top surface of the wing — the three ply strut plates for each wing panel, and the balsa sheeting for the aileron pushrod exit. Cut out the rectangular holes in the root rib on each wing panel for the hardwood spar support. Prepare the aileron servo compartment access hatch. Drill the hole through the root rib for the servo wire.

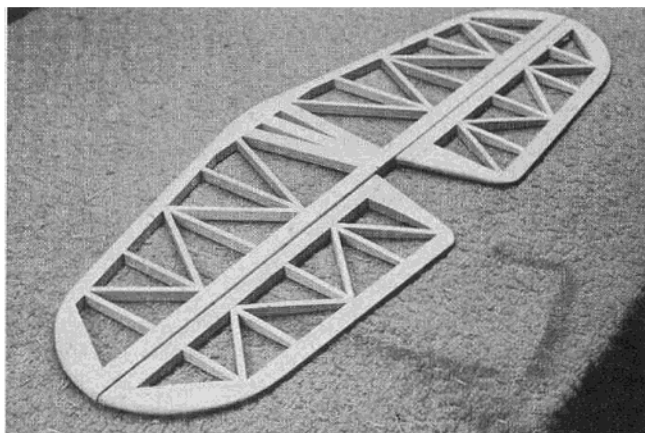
Detail sand the wing. By referring to the plans you'll note that from the front view, the curve on the top of the tip is greater than the curve on the bottom. To sand the wing tip to the desired shape, a reference line is needed. Pin the wing panel down on your building board with the trailing edge blocked up such that the datum line on rib #14 is parallel to your building board. Stick a pin through a block of balsa so the point sticks through the other side and lines up with the center of the trailing edge at the aileron. Move the block around the wing tip to scratch a mark from the trailing edge to the leading edge. Note that at the leading edge this mark will be a bit below

**If you haven't gotten into the 1/4 scale models, give Joe's a try. It makes a good first "biggie" for the experienced flyer. The Rearwin is a long time favorite of many modelers.**





**Completed fin & rudder.** The leading edge of the fin is not yet cut to length.



**The nearly completed stab and elevator halves.** Hardwood joiner yet to be added.

the center of the leading edge because of the semi-symmetrical airfoil. Then, use a soft pencil to darken the line so it's easy to see. Sand the top and bottom of the wing tip to this line.

To sand the leading edge to shape, pin the false rib (which is to be glued to the fuselage sides later) to the root of the wing panel. Trace around the front of the false rib to guide your sanding. The leading edge must fit this shape exactly. Add the aileron clevis rod and the servo to bellcrank linkage and you're ready to cover the wings. Because of the difficulty in removing and installing the servo arm screw in this installation, a metal solder-on clevis may be used. If you wish to use an adjustable clevis, a coupler may be used to solder the clevis rod to the piano wire pushrod. Make certain that the coupler will be located in the center of one of the bays so it won't bind on a wing rib as the servo is operated.

#### **Preparing To Build the Fuselage**

In preparing to assemble the fuselage sides, you have 24 cross braces to cut. And, the cross braces at different locations are to be cut from either 3/8" x 1/2", 3/8" x 3/8", or 1/4" x 3/8" balsa strips. By looking carefully at the fuselage side view you can determine which size is required for each location.

Because the fuselage sides are parallel from the nose to the trailing edge of the wing, all of the cross braces in this area are exactly the same length. The width of the landing gear plate can be used as a guide to cut these cross braces. When the cross brace just behind the trailing edge of the wing is installed, the sides of this brace will have to be sanded down slightly to fit. The top view of the fuselage on the plans can be used as a guide to cut the cross braces at each of the locations behind the wing.

With all of the cross braces cut, glue the cross braces to the front and back of the landing gear plate as shown on the plans. Next, cut the rectangular holes in the 3/8" balsa cabin top blocks for the hardwood spar supports. To mark the

cut-outs, pin the cabin block template cut out from the plans to the root rib of one wing panel. Because 1/8" sheeting will be glued to the top of the cabin block, the template should be pinned to the root rib 1/8" below the top surface of the wing. Using the holes in the root rib as a guide, mark and cut out the rectangular holes in the template. Then, use the template to mark the holes to be cut in the 3/8" balsa cabin top blocks. Cut out the holes. Save the template to mark the rectangular holes in the false ribs to be glued to the fuselage sides later.

#### **Building the Fuselage Sides**

To assure the fuselage sides are exactly alike, the second fuselage side is built on top of the first side over the plans. When the first fuselage side is completed, a piece of plastic kitchen wrap is laid over the fuselage side before construction of the second side begins. The kitchen wrap is pressed down over the pins. So the hold-down pins won't have to be removed as the second side is built, groups of three pins are used to bracket the wood pieces without piercing them. Then, when the second side is built, the balsa pieces can be set in place between the pins. If needed, however, the top fuselage side parts can be pinned directly to the lower fuselage side. Normal straight pins rather than "T" pins are used so the kitchen wrap can be easily pressed down over the pins.

Begin construction by splicing the bottom longeron pieces together as shown on the plans. Epoxy should be used for this joint and all of the other construction in this sequence. As you assemble the fuselage sides you will be cutting and installing the bottom, center, and top 3/8" x 3/8" longerons, the 3/8" x 1/2" upright immediately behind the front bulkhead, the long one-piece angled upright that glues to the forward end of the cabin top block, the shorter angled upright piece that runs from the middle longeron to the bottom longeron at the location of the center of the landing gear plate, the angled piece that

runs from the location of the back of the landing gear plate to the middle longeron, the vertical piece that runs from the middle longeron to the bottom of the cabin top block, and the 3/8" x 3/8" angled piece at the top rear of the cabin. In addition, you'll install that upright at the aft of the servo compartment, the cabin top block, and the upper and lower vertical pieces in the middle of the fuselage behind the wing, those directly under the leading edge of the fin, and at the tail.

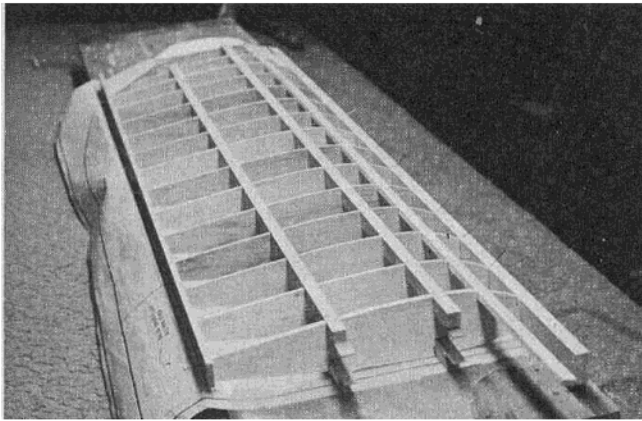
When cutting and installing the center longeron, note that it is installed in three pieces. One piece runs from the back of the bulkhead to the first angled upright, another from there to the upright at the aft of the servo compartment, and the last piece from the servo compartment to the upright at the tail of the fuselage. When cutting the 3/8" x 3/8" vertical piece at the aft of the servo compartment and installing the balsa top block and top longeron, the forward end of the top longeron must extend 1/8" above the cabin top block and rest on the top of the upright piece. This is required to mate properly with the sheeting to be added to the top of the cabin top block later in the construction sequence.

Also install the 1/4" x 3/8" angle brace in the bottom rear of the servo compartment and those above and below the middle longeron aft of the servo compartment. Do not install the balsa pieces shown on the plans above the stab at this time. They are custom fit to the stab and stringer later.

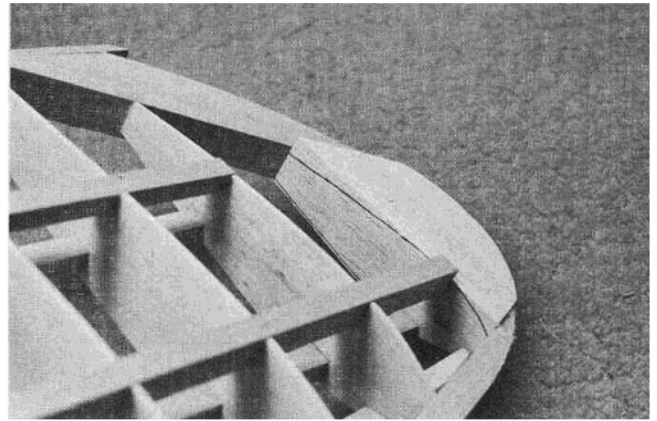
To finish work on the fuselage sides, add the ply cabin block doubler to the inside of the fuselage sides. This doubler overlaps the 3/8" x 1/2" forward and 3/8" x 3/8" rear pieces. Mark the location of the landing gear plate on the inside of each fuselage side.

After the adhesive has set up on both fuselage sides, they may be removed from the building board and the rectangular holes cut through the ply doublers.

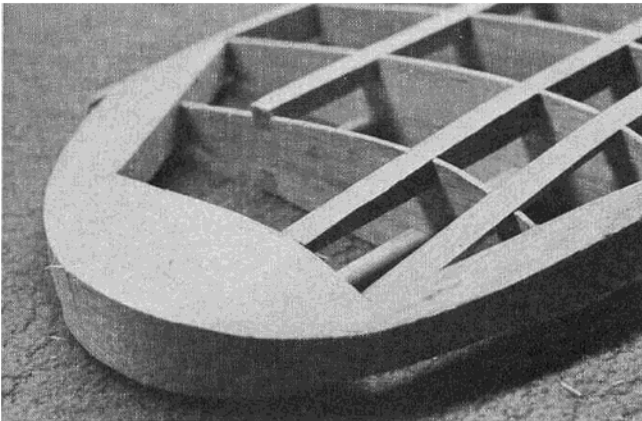
#### **Assembling the Fuselage Sides**



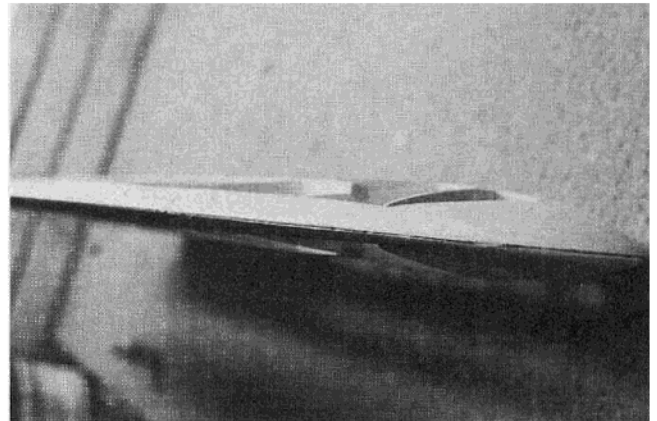
*Wing panel all framed up. Webbing yet to be added.*



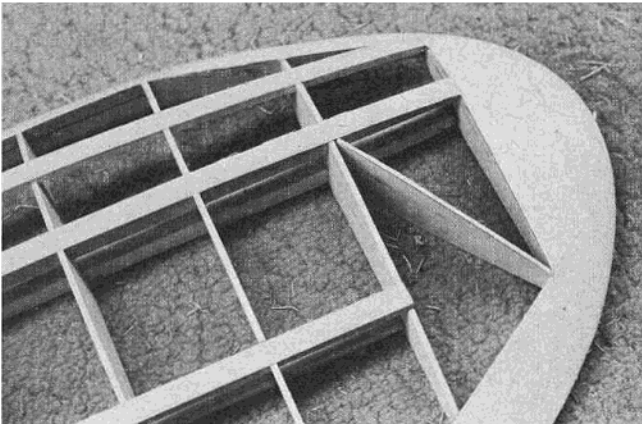
*Wing tip blocks glued in place. Note rib contour center tip block.*



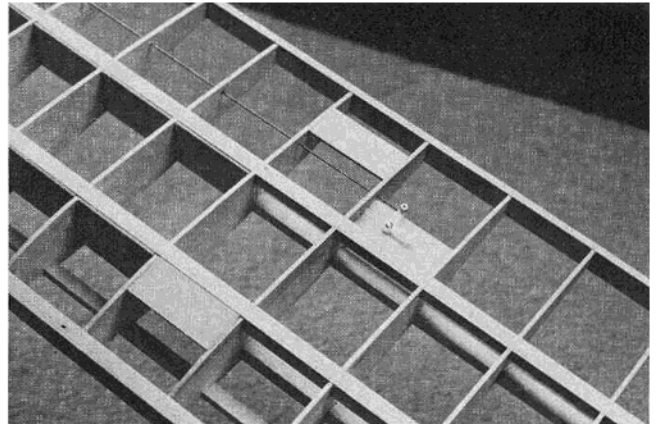
*Tip configuration sanded to top view. Geodetic rib yet to be installed.*



*View of wing tip showing reference mark for sanding.*



*Wing tip with geodetic rib installed.*



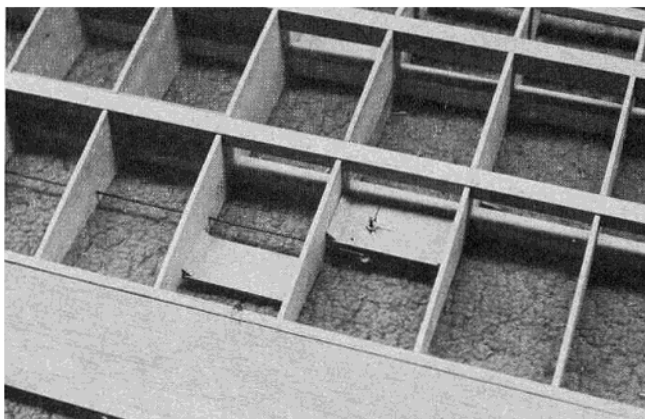
*Bellcrank and outboard strut mounting plate detail. Inboard mounting plate not yet installed. Bottom view.*

Remember that the ply cabin block doublers are on the inside of each fuselage side. Lay one fuselage side on your workbench with the "inside" up. Using 5-minute epoxy, glue in all of the cross braces and ply landing gear plate from the nose to the upright at station "C". Use a carpenter's square when you glue these cross braces in place to assure they are at 90° to the fuselage side. Do not, however, glue in the cross brace at the wing trailing edge. Then, the

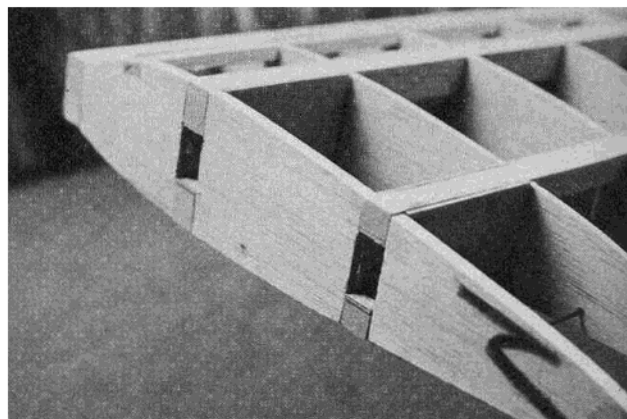
other fuselage side is to be glued in place to those cross braces and landing gear plate. Use a slower set-up epoxy to give you plenty of time to align the fuselage sides before the epoxy cures. Use a carpenter's square along the bottom, nose, cabin blocks, top and tail to make certain the fuselage sides are perfectly aligned with each other. A couple of books or other weight can be laid onto the upper fuselage side to hold it accurately in place while the adhesive

sets up.

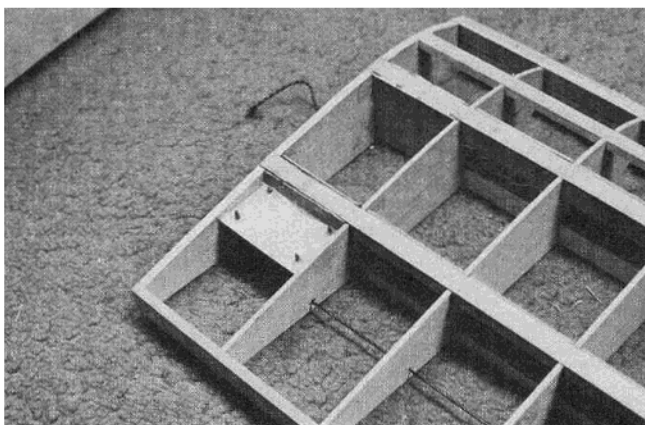
With the front of the fuselage sides glued together, the fuselage is to be shifted to an upright position. Glue the fuselage sides together at the tail. To do so, however, the inside of the fuselage sides at the tail will have to be sanded so when they are glued together the tail will be approximately 1/16" outside of the fin tail post on each side of it. This approach will allow you to add filler at the step and sand to the fuselage contour without



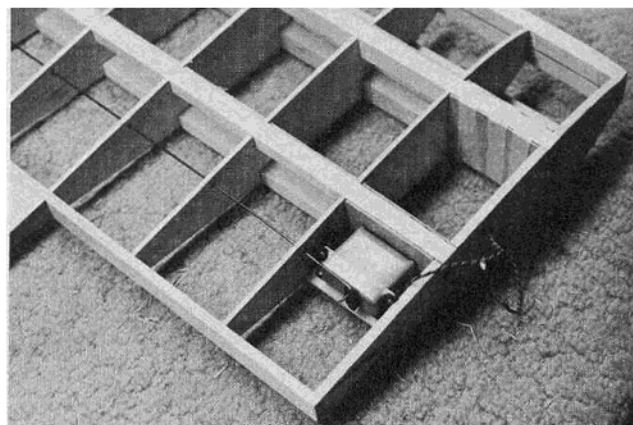
**Bellcrank and outboard strut mounting plate detail – top view.**



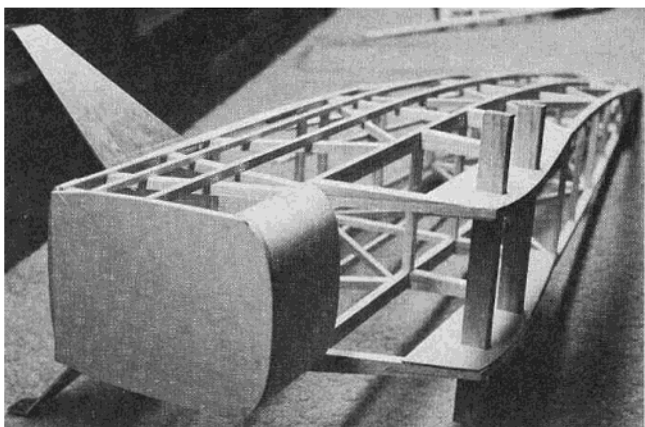
**Root rib cut-out, ply plates added to form spar box. Triangle stock not yet added.**



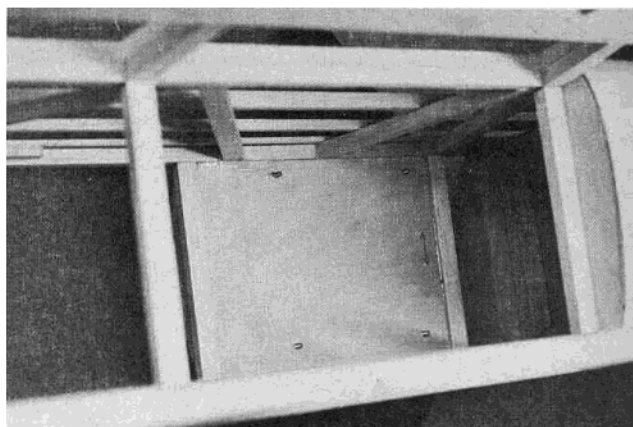
**Top view of wing showing servo mounting plate detail. Servo mounting bracket screws may have to be cut down.**



**Bottom view of wing showing servo installation. Triangular braces not yet installed on ply spar support braces. Aileron servo wire exit not yet drilled in root rib.**



**Fuselage with landing gear installed.**



**Inside view of ply landing gear mounting plate.**

sanding down the back of the fin tail post. Add the cross braces on the middle and bottom longerons from station "C" to the tail.

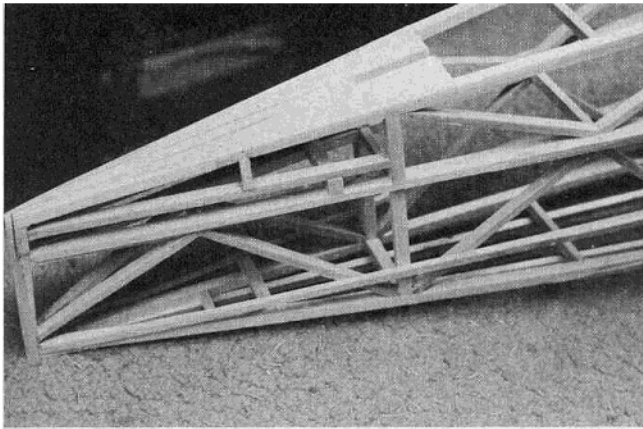
Next, the fin saddle block is to be cut and glued in place at the tail between the longerons. The 3/8" slot on the centerline is both for the fin leading edge and the top stringer. When properly installed, the back end of this block should be flush with the top of the longerons while the front edge should be

1/8" above them. Add a piece of 1/8" balsa scrap onto the top of the longerons along the length of the fin saddle block.

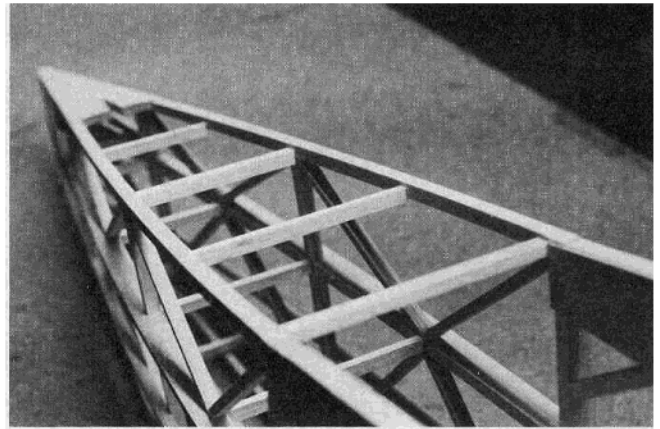
By looking at the plans you'll find that the cross braces along the top longerons are glued in place at an increasing depth from front to the rear below the top surface of the longeron. To glue these cross pieces in place, begin by sanding the edges of the cross brace at the wing trailing edge for a custom fit. Glue it in place 1/8" below the top surface of the

longerons. Then, to locate the remaining cross braces, temporarily put the top stringer in place so it rests on the cross brace just installed at the wing trailing edge and fits into the slot in the fin saddle block flush with the top surface. Using a straight-edge along the stringer, glue the remaining cross braces in place so they contact the bottom of the stringer. Do not glue the top stringer in place yet.

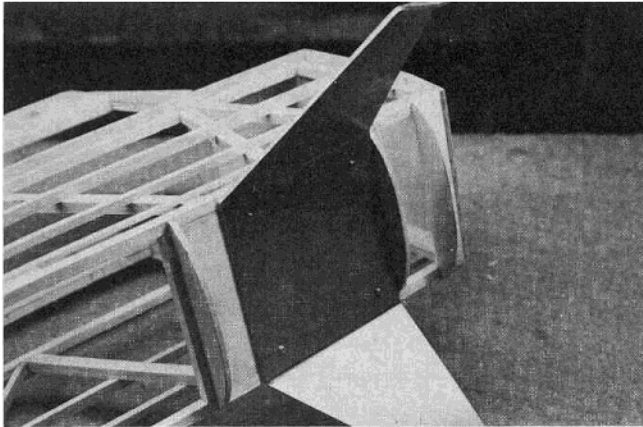
Install the triangular stock braces at the nose of the fuselage. If you wish, the



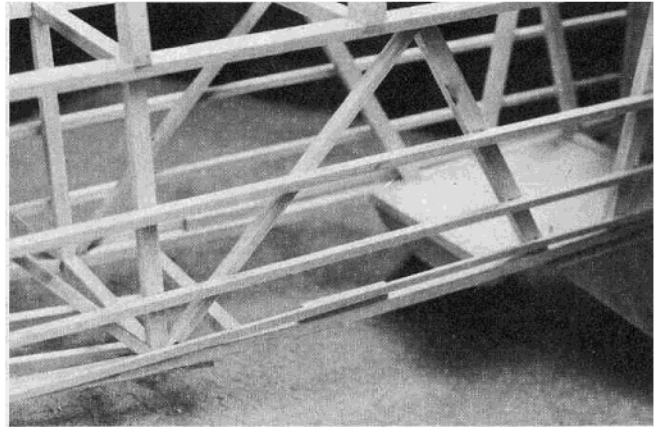
*Fuselage details at tail section.*



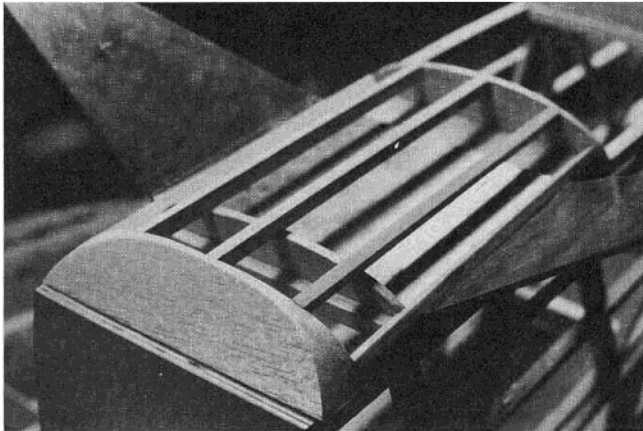
*Top cross braces are installed at depth below top surface of longerons. Cabin top sheeting removed in this prototype.*



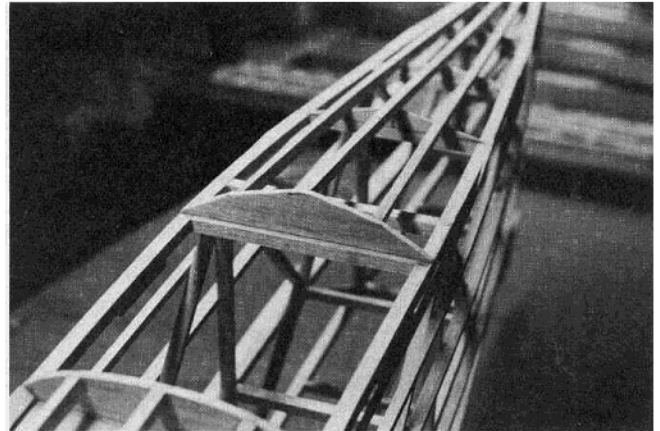
*Bottom fuselage – landing gear installation. Balsa strips not yet installed down bottom of landing gear. Access hatch behind formers.*



*Side stringer detail showing bottom stringer brace.*



*Bottom view of fuselage front showing stringer detail.*



*Fuselage bottom showing access hatch detail. Note rounded front former and angular rear former.*

firewall may be temporarily held in place to align these pieces. Glue the two formers in place on the top front of the fuselage and add the top sheeting. As you did earlier, the firewall may be used as a guide to align the front of the former and sheeting. After the sheeting is glued in place, the ply bulkhead is to be installed. Note, however, that the bulkhead should be down below the surface of the curved sheeting just enough so when the cowl is in place on

top of the bulkhead, the top of the cowl will be flush with the top of the sheeting. Use epoxy to glue the bulkhead in place.

Next, the top of the fin saddle block is to be sanded to form a straight line from the base of the fin to the side of the longeron. Temporarily put the fin in place and draw a line down the fin saddle block along both sides of the base of the fin. Remove the fin from the fuselage. To prevent sanding into the longeron when you shape the fin saddle

block, stick a piece of masking tape along the side of the top longerons so the tape aligns the top edge. Use a sanding block to sand the fin saddle block and balsa scrap pieces on top of the ailerons to a straight line from the side of the fin to zero at the corner of the longerons. Sand carefully so you don't nick the sharp edge of the longerons.

#### **Adding the Bottom Stringers and Access Hatch**

Turn the fuselage upside down. Add

the triangular shaped block and two formers between that block and the access hatch. Mount the dural landing gear. Add the three stringers forward of the access hatch. Add the piece of 1/4" x 3/8" balsa to each side of the bottom of the front fuselage with 5-minute epoxy so that these pieces align with the longerons from the bottom and glue to the bottom of the dural landing gear. These pieces provide a base to which the bottom covering material is applied to the fuselage along the bottom of the landing gear.

Cut the remainder of the triangular shaped formers which are located aft of the access hatch. To do so, refer to the plans and measure the side to side width and top to bottom height of each former. Note that each former overlaps only half the width of the bottom longerons. Cut out each former as a rectangle. Then, mark the width of the center stringer on each former. Draw a straight line from the outside of the stringer to the bottom corners and trim the formers to shape. Each should look like a triangle with the point cut off. See the section "C" cross section view on the plans. Glue all of the formers aft of the hatch in place and add the stringers.

To build the radio compartment access hatch, cover the longerons in the hatch area with a piece of plastic kitchen wrap. Pin the rounded forward and triangular shaped rear hatch formers to the fuselage formers at the front and rear of the hatch opening. Glue and pin down the two 1/4" x 3/8" balsa pieces that run along the longerons from the front to the rear hatch formers. These pieces should take the gentle bend of the longerons on which they rest. Add the two side stringers between the two formers. You'll note that the center stringer has a pine hardwood block glued to each end. These blocks are to accommodate the hatch hold-down screws. Glue the block to both ends of the center hatch stringer with the grain running parallel to the stringer. The face of the rear block will have to be sanded to an angle to mate square with the angled former. Put the bottom stringer/block assembly temporarily in place. Mark it so you can shape it to the shape of the front and back formers. Shape it and then glue it in place with epoxy. Add the two 1/8" ply plates between the longerons for the 4/40 hatch mounting screw blind nuts. Drill the clearance holes through the blocks and hole through the plates for the blind nuts. Remove the hatch from the fuselage and install the blind nut in each one. To complete the construction of the hatch, the edge bottom 1/4" x 3/8" pieces are to be shaped to the contour of the hatch formers. To do so, stick a piece of masking tape to the side of the longeron in the area of the hatch. Mount the hatch. Use an X-Acto knife or

sanding block to shape the hatch bottom pieces to the former contour. Do not sand into the edge of the former.

Next, add the side stringers to the fuselage. Note that the two upper stringers are 1/4" x 3/8", the next is 1/4" x 1/4", and the bottom stringer is 1/8" x 1/4". The two 3/8" x 1/4" stringers will have to be spliced for the required length. To prevent the covering material from distorting the bottom stringer as the covering is applied, a brace is added in the area of the hatch and another to support the stringer under the stab. When the stringer that is glued to the middle longeron is installed, the top surface of the stringer should be flush with the top surface of the longeron. Glue the side stringers in place.

Once installed, all of the stringers are to be tapered to zero at the tail in top view. Draw a vertical line across the side stringers on both sides of the fuselage approximately 2 1/2" in front of the fin. Use a straight-edge to draw a straight line from this point to zero at the tail. Cut the stringers to shape.

In order that the covering material will follow the proper contour from the middle longeron stringer up to the cabin top block, wedge shaped pieces of balsa are to be added next. A wedge shaped piece is to be prepared for the front, middle, and rear supports in the cabin area. The front two are cut from 3/8" x 1/2" balsa. The other is cut from 3/8" x 3/8". They run from the stringer to the center line on the balsa rib shown on the fuselage side view. Cut the balsa to length. To form the wedge shape, they are cut in side view from the width of the stringer at the bottom to zero at the top. Cut and glue these pieces in place. Next, a similar wedge shaped piece is to be added to the upright piece at the leading edge of the fin. Cut from 3/8" x 3/8" balsa, this piece runs from the width of the stringer at the middle longeron to zero at the top edge of the top longeron. Finally, a wedge shaped piece is added to the angled piece at the upper rear of the cabin. Cut from 3/8" x 3/8" balsa, this piece runs from the upright to the false rib center line. The wedge is shaped from the thickness of the wedge along the upright to zero at the rib center line. Note, however, that this wedge shaped piece must also be shaped to the angle of the wedge at its root. Tricky, but necessary for a good job. Shape it and glue it in place.

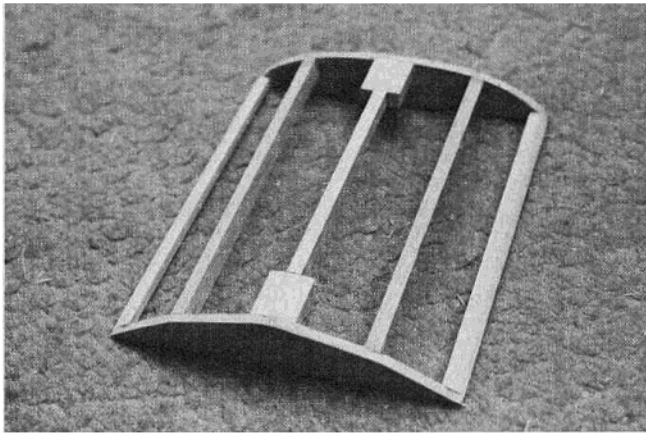
#### **Checking the Wing Alignment and Installing the Spar Supports**

Put the spar supports temporarily in place and install the wings. Check the wing incidence, which should be zero with the stab. If it's necessary to raise or lower either or both of the wing spar supports, a hardwood shim must be used to fill any gaps between the hardwood spar supports and the balsa cabin block. Also, double check the alignment of the wing panels to each other. As you check the alignment of the wing, it should not fit flush to the cabin blocks because the false ribs have not yet been installed.

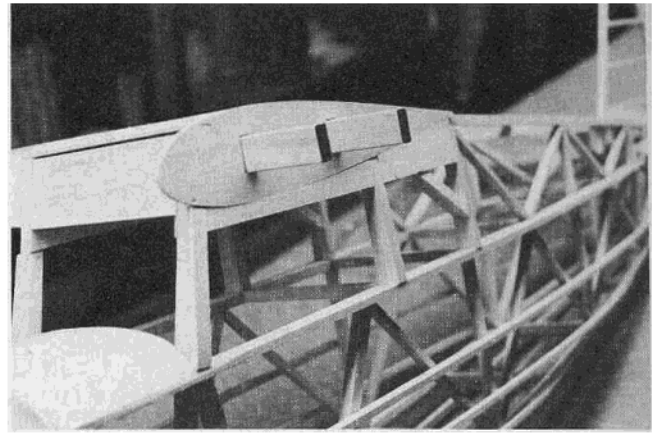
When the wings are perfectly aligned to each other and the fuselage, set at the proper incidence and, still in place on the fuselage, tack glue the hardwood spar supports in place by working through the top of the cabin. Then, add the balsa blocks above and below each spar support as shown on the plans.

Remove the wings. Put a bead of 5-minute epoxy on the cabin blocks around each spar support. Use a blade screwdriver to press the epoxy into the spar support/cabin block glue joint. Use the cabin block template you used earlier to cut the rectangular holes in the cabin blocks to mark and cut the holes in the false ribs. Remember to allow 1/8" at the top of the template for the sheeting when you align it with the contour of the top of the false rib. Slide the false ribs onto the hardwood spar supports and put the wing panels in place again. Align the false ribs perfectly with the root rib of each wing panel. As you do so, draw a line along the bottom of the false ribs on both sides of the fuselage. Remove the wings and the false ribs. Cut off and remove the part of each wedge shaped piece under the false ribs so the false ribs will mount flat to the cabin top block on each side of the fuselage.

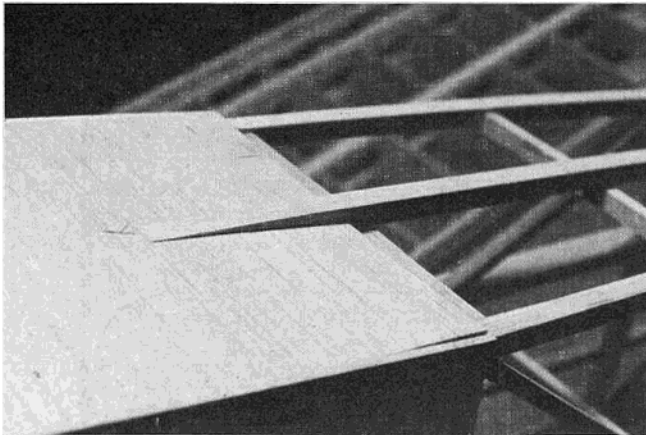
**From  
RCModeler  
Sep. 1978**



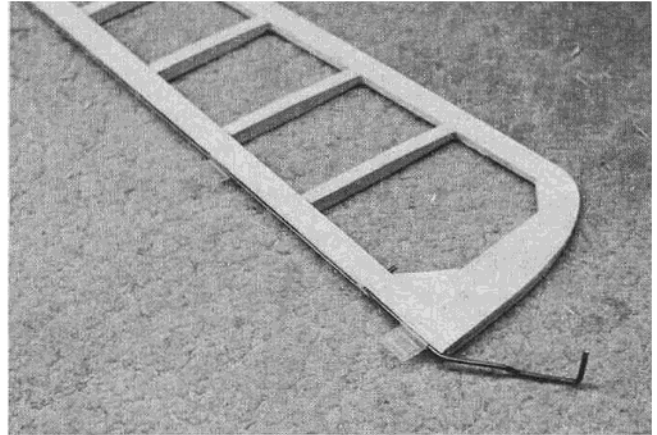
**Hatch detail.** Note rear angular former and rounded front former.



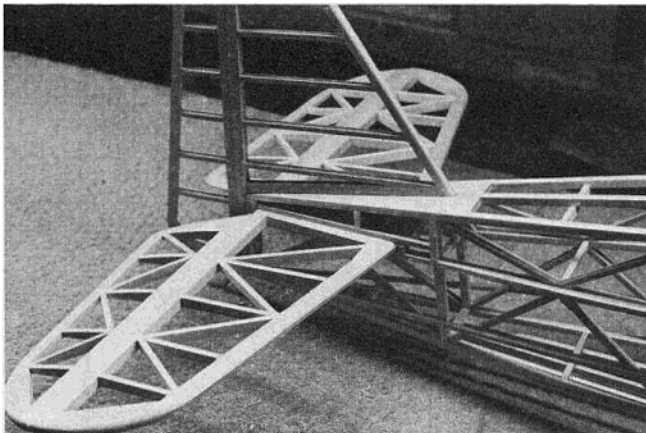
**Cabin detail showing false rib and balsa filler block.**



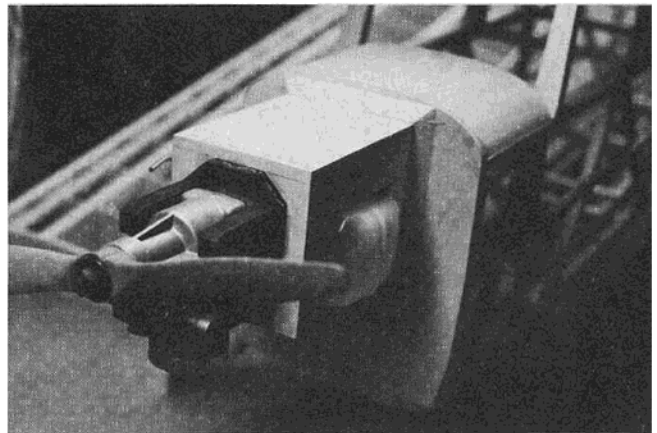
**Cabin top showing spar sanded to contour.**



**Tail wheel strut installation.**



**Tail section completed and glued in place.**



**Engine mounting box detail.**

To glue the false ribs in place, put a coat of epoxy onto the cabin block side of each false rib and slide it in place onto the hardwood spar supports. Before the adhesive sets up, slide the wings in place and perfectly align the false ribs with the root rib of each wing panel. Be certain that the false ribs are held snug to the root rib of the wing panels while the adhesive sets up to make a perfect wing to fuselage fit.

Remove the wings from the fuselage

and fill any gaps between the false rib and cabin block with some epoxy. Next, the piece of balsa sheet cut to mate with the contour of the bottom of the false rib and extending to the bottom edge of the cabin block is cut into pieces so it can be glued in place between the wedge shaped pieces. When properly located, these pieces of sheeting should assume the angle of those wedge shaped pieces and be flush with them. Add the 1/8" balsa top cabin sheeting. Check the fit to

the false ribs before the sheeting is installed so a shim can be added along the top edge of the cabin top blocks if needed.

#### **Completing the Fuselage**

Glue the top stringer in place. The forward end overlaps the cabin top sheeting and is shaped to the contour of that sheeting. Add the upper balsa stab brace by first laying the stab in place in the fuselage. Cut the balsa piece for a

snug fit and glue it in place. Note that the side of this piece is flush with the side of the tail block at the rear and flush with the wedge shaped piece at the front end. Let the stab brace extend far enough out of the side so after it is installed it can be sanded to the angle of the wedge shaped piece at the forward end. Add the vertical piece between the longeron and stab brace at the front of the stab, making sure you allow room at the back end of the stab for the elevator torque rod. Then, add the vertical piece that runs up from the stab brace to the upper longeron. Sand the side of the stab brace to the angle of the wedge shaped piece.

The fin and stab may be installed at this time, or after they are covered. Before you glue the stab in, the elevator must be in place. Check the fit first, though, and relieve the tail of the slot as necessary for clearance of the elevator torque rod. Add the gusset at the front of the fin after the fin is installed. Fill in the step at the fin tail post and sand to the fuselage contour. Then, the rudder may be hinged. With the location of the rudder and elevator horns determined, the pieces of balsa for the elevator and rudder pushrod exits are to be cut and glued in place as shown on the plans. They should be flush with the side of the angle braces to which they are glued so there will be no indentation in the covering material in the area of the pushrod exit.

The cowl is mounted to the nose of the fuselage with one screw down through the top of the cowl into the top of the bulkhead. Hardwood blocks are added to the front of the bulkhead to which the bottom sides of the cowl are screwed. See the plans.

As shown on the plans, the engine is mounted to a ply box glued to the front of the bulkhead. The plans show an engine mount system for a regular .60 engine. If you're going to use a prop reduction unit, pumper, or Quadra, the engine mounting box will have to be modified accordingly. When building the engine mount system as designed or modified for a different engine, it's important that the engine be mounted at zero to the stab. The face of the box should therefore be at 90° to the center longeron — which is the datum line for the aircraft. In addition, 2° right thrust is required. The back of the engine mount may be sanded to achieve this thrust angle. Build and install the engine mounting box using epoxy.

With the engine mount prepared for the desired right thrust, the cowl is used as a guide in the installation of the engine mount. First, the position of the engine on the engine mount is determined so there will be 1/16"

clearance between the spinner back plate and cowl. Then, the engine is positioned on the ply box so the prop shaft is centered as necessary on the front of the cowl. To do so, hold the fuselage on its tail. Lay the engine mount-engine in place onto the front of the engine mount box. Carefully put the cowl in place. Using a long screwdriver inserted through the air intake, move the engine mount as necessary to center the prop shaft. Remove the cowl and mark and drill the holes into the face of the box for the engine mount screws.

Add the piece of 1/8" balsa sheet across the front of the fuselage between the forward cabin supports. Glue in the reinforcement blocks that are to be added to the front inside end of each false rib. Install the strut mounting plates onto the ply landing gear plate as shown on the plans. A piece of scrap balsa is to be glued to the top side of the aluminum bracket as was done with the landing gear so you'll have some place to fix the covering material above the plate. Add the dowels in the area of the windshield as shown on the plans.

Slide the wing in place onto the hardwood spar supports, making certain it is snug to the fuselage. Turn the fuselage/wing over and drill the pilot holes for the wing mounting screws through the plates in the bottom spars and partially into the hardwood spar supports. Remove the wing and enlarge the pilot holes for clearance. Finish drilling the pilot holes through the wing spar supports and thread them for 4/40 mounting screws. Do the same for the other wing.

Build the wing struts. To make the job a bit easier than suggested on the plans, K & S airfoil tubing may be used for the main struts. To mount the dowel cross brace, the ends of the dowel should be sanded to fit snug to the cross brace. By adding a short piano wire pin in each end of the dowel and drilling a hole in the aluminum struts, the dowel cross brace can be glued to the struts. The upright from the dowel cross brace can be glued to the dowel. It can be attached to the inboard strut plate by attaching a piece of aluminum with a 90° bend to the wing and using a clevis on the upright. As shown on the plans, an aluminum plate on the upper end of the struts is screwed to the plate in the wing. When the exact location of the strut mounting plate is determined, blind nuts are installed in the plate. A nut and bolt is used to attach the bottom of the strut to the bracket on the fuselage. Drill the hole in the cabin top block for the aileron servo wire. Detail sand the fuselage. Install the remaining servo linkage, servos and wheel pants. Commercially available wheel collars with a flange may be used.

Resin should be used to seal the firewall and engine mounting box. The aircraft may be covered with any of the plastic heat shrink film covering

materials. Or, silk and dope may be used. Add the windshield and side windows.

In an .049 Rearwin Speedster M6000M construction article by Larry Maynard in the December 1977 R/C Modeler Magazine, the author indicated two sources for historical data he used were the Northrop Institute's American Hall of Aviation History and photographs from John Underwood of the American Historical Society. In that article, Mr. Maynard commented that he found contradictions in the historical data which were due largely to inaccurate press releases given out by the Rearwin Company. Aviation and Aero Digest articles published when the certificate AR661 was issued, indicate the NC 15865 prototype flew with the Cirrus Hi-Drive engine. Yet, they also suggest that the power plant was the Menasco C4 or C4S. It turned out that all of the 11 aircraft produced used the Menasco engine, hence the M6000M designation.

The best source he found for the color scheme, was a Mr. Gene Salvay who worked for Rearwin as a college student. Now that's finding resources. According to his data source, all of the Speedsters were either Stearman vermillion and light Curtiss blue trim or vice versa. All had the same silver stripe on the fuselage and wheel pants outlined in black pin stripe. NC 19410 and NC 20741 were vermillion with blue. NC 19412 was blue with vermillion. NC 20741 in its current configuration is Cub yellow with a black design on the side of the fuselage. The shape of the design and N number can be found in a photograph in the September '63 issue of Air Progress. Our thanks to Larry Maynard and RCM for the helpful information.

Good flying. □