

# SPUNKY

ASSEMBLY MANUAL



Please read the tips section at the back of this manual regarding the use of laser cut parts. The proper removal and preparation of these parts is important. When laser cut, some materials may exhibit some charring of the edges. This is especially so on composite materials such as plywood. When gluing these parts at the laser cut edge it is important to use the correct adhesive. It is recommended that you use only medium or thick Cyanoacrylate (CA), Aliphatic resin or Epoxy on these joints. Use of thin CA may not give you a strong bond. The thin CA may only penetrate the thin layer of charred material before it sets, yielding a weak bond. Thick and medium CA, Aliphatic Resin and Epoxy will allow time for the adhesive to penetrate the char and bond to the material for a stronger joint.



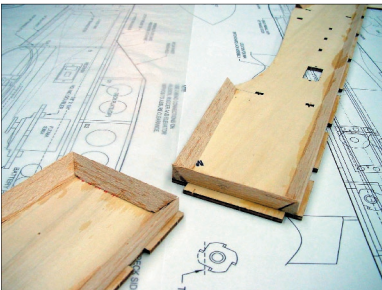
#### ❑ Step 1

Glue a strip of 3/8" triangle stock along the top edge of both fuselage sides on the labeled side. Be sure to align the stock with the recessed edge as shown. Also add triangle stock to the bottom fuselage edge for and aft of the wing opening. Note the markings on the fuselage, they indicate where to stop the triangle stock.



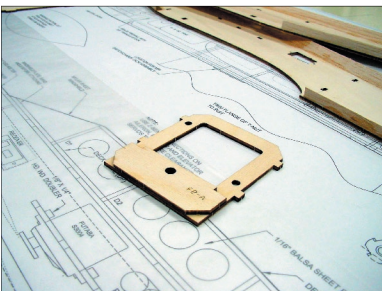
#### ❑ Step 2

Mark the back side of a piece of triangle stock as shown and cut it on these lines. Then flip the triangle stock around and glue it onto the fuselage aligned with the notches in the front edge of the fuselage, see the photo in step 3.



#### ❑ Step 3

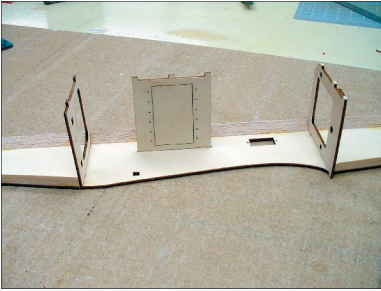
The fuselage sides should look like this. The triangle stock at the front of the fuselage will support the motor mount when installed. Note that the triangle stock is aligned with the notches, not the end of the fuselage.



#### ❑ Step 4

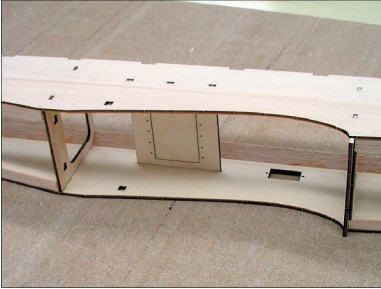
Assemble F-2 and F-2A as shown, use a 1/4" drill bit shank to assure the dowel holes line up with each other and the two parts are aligned along the opening in the center. Do not use a wood dowel to do this as it may become permanently glued. Also glue two pieces of 1/8" x 1/4" spruce to the top of the servo plate

along the screw holes, this will provide a better grip for the servo mounting screws.



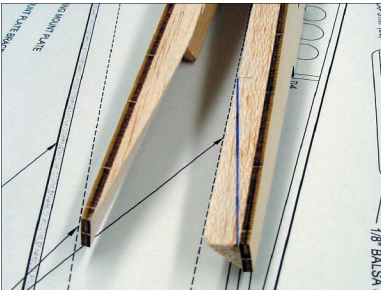
#### □ Step 5

Lay one fuselage side flat on the bench. Install F-2, F-3 and the servo plate into their perspective notches. Assure that the triangle stock does not interfere with the parts making good contact with the fuselage. If so trim it back until contact is assured. All former labels must face the front of the fuselage.



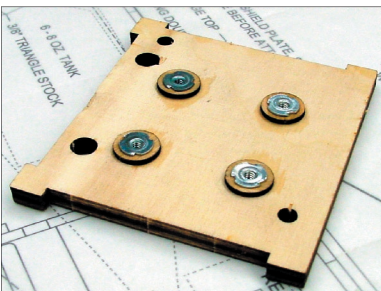
#### □ Step 6

When correct fit is obtained, glue all three parts to the bottom fuselage half using the top fuselage half to apply pressure. Then flip the assembly over and glue all three parts to the other side. Run a bead of medium CA along all joints for added strength.



#### □ Step 7

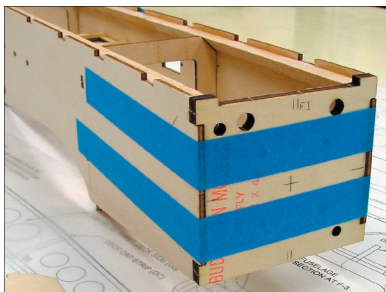
Measure 2-1/2" from the fuselage end and mark the inside of the triangle stock. Then draw a line from that mark to intersect with the fuselage side as shown. Remove the triangle stock along this line as shown to allow the tail section to come together. Install F-4 but do not glue it yet. Carefully align the tail sections and glue them together.



#### □ Step 8

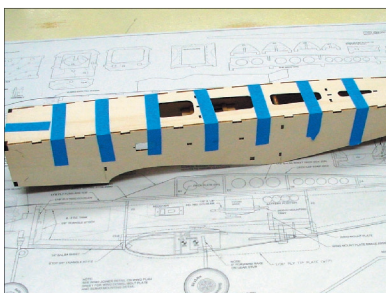
Install four #4-40 blind nuts into four of the 1/16" ply pads and then glue these assemblies to the back of the firewall in the motor mount holes. The labeling is on the front of the firewall.





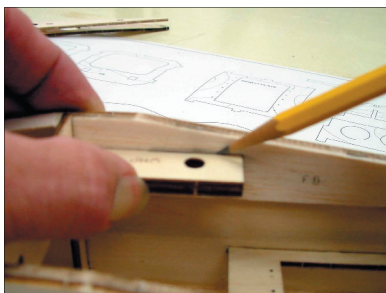
#### □ Step 9

Use Epoxy to install the firewall onto the fuselage. Use masking tape to assure good contact between all parts. Note that 1-1/2° of right thrust is built into the firewall.



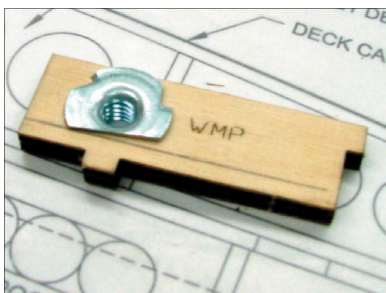
#### □ Step 10

Test fit the fuselage top and then use an adhesive that will give you time to pull the top and sides snugly together and hold it there with masking tape until cured, such as aliphatic resin. Now glue F-4 permanently into position.



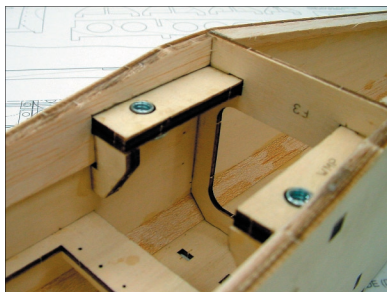
#### □ Step 11

Glue on the 1/8" Balsa wing saddle doublers and then snap the wing mount plates temporarily into position. Draw a line along the fuselage side onto the wing mount plates.



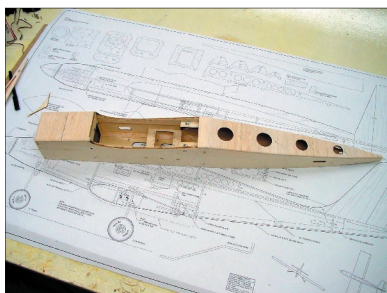
#### □ Step 12

Trim the flanges of two #1/4-20 blind nuts to the line as shown and install them into the wing mount plates. Be sure to make one left and one right. Then Epoxy these plates into the fuselage sides with the blind nut flanges facing the top of the fuselage.



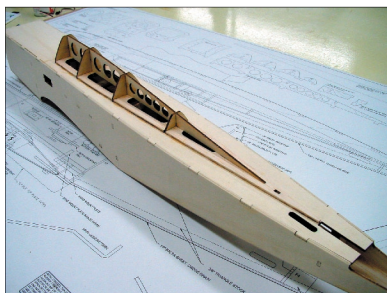
### Step 13

Epoxy the wing mount plate braces in place as shown. Then flip the assembly over and add a 1-1/4" piece of triangle stock gusset to the top of each wing mount plate. You can access this through the holes in the fuselage top.



### Step 14

Assemble the 1/8" bottom sheeting for the tail section and the 1/4" sheeting for the forward bottom section and glue in place. Now is the best time to sand all sides of the basic fuselage smooth. Sand all corner radius's at this time as well.



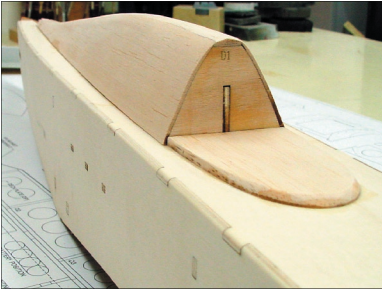
### Step 15

Assemble the top deck plate and formers, D-1 through D-4 and the top deck keel in place in the fuselage top. Glue this assembly in place.



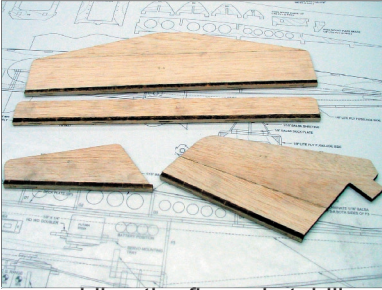
### Step 16

Glue the top deck cap strip on and trim the edges to the contour of the formers. Install the 1/16" side sheeting by gluing along the deck plate at the fuselage top first. Then lay it over and glue it along the cap strip. You can glue it to formers D-1 through D-4 through the openings in the top from the bottom of the fuselage.



### Step 17

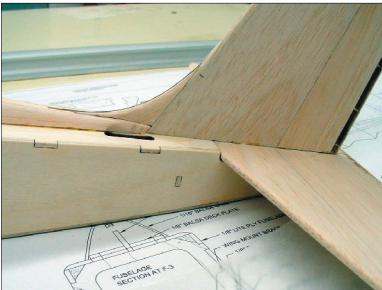
Trim and sand the top deck to shape as shown and then add the cockpit floor. Angle sand the cockpit floor as shown to accept the windshield later. The basic fuselage structure is now complete.



### Step 18

Glue the stabilizer sections A & B and the stabilizer trailing edge together. Glue the elevator and elevator trailing edge together. Glue the vertical fin sections A & B together and then glue on the vertical fin trailing edge. Glue the rudder and rudder leading edge together and sand all these components out. When components, use the marks on the parts

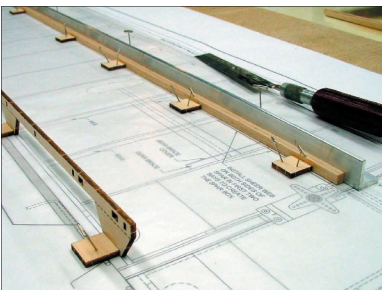
assembling the fin and stabilizer for alignment.



### Step 19

Use the center line marked on the stabilizer assembly to align the stabilizer on the stabilizer saddle. Butt the stabilizer up against the fuselage top. Check that it is perfectly horizontal when the fuselage is setting flat on the bench and then glue it on. Install the vertical fin, check that the trailing edge splits the center line

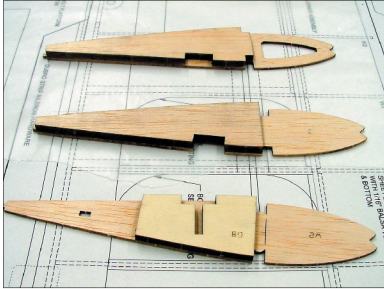
on the stabilizer and then glue in position. Use a generous application of adhesive on the stub that butts up against F-4 inside the fuselage. You can access this joint through the hole in the bottom sheeting.



### Step 20

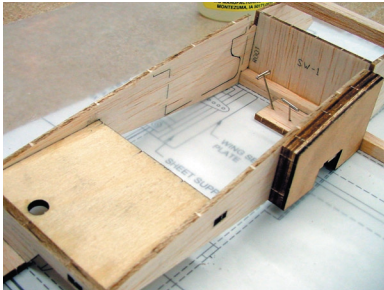
With the wing plan on the building board, align a straight edge with the leading edge of the spar and secure it there with pins. Now butt the 1/4" Square balsa spar up against it and glue a pinning tab to the back of the spar. Pin this tab securely to the building board. Place one of these tabs at every other bay.

Add pinning tabs to the break away feet on the false trailing edge and also pin these firmly to the building board. Note that the 1-1/2° washout is set by the false trailing edge. Be sure that the break away feet are flat to the building board while assembling.



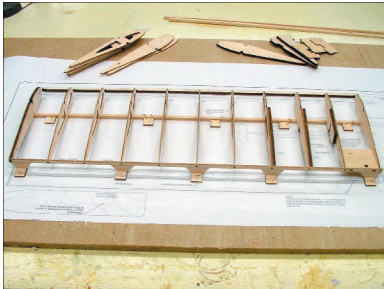
□ Step 21

Assemble W-2, GB and GBC. Assemble W-3 and W-3B. Assemble one W-4 and W-4B. To assure a left and a right wing set, assemble these components for both wings at the same time. Making sure to construct mirrored sets. That way you can not go wrong. Also take care to align the parts with each other.



□ Step 22

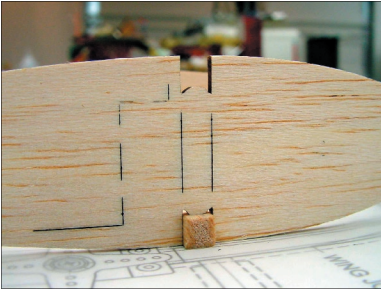
Glue sheer web SW-1 to the bottom spar observe the correct orientation of the dihedral angle. Align it to the line for W2 on the plan. Install W1 using SW-1 to set the dihedral angle. Install WBP and the W2 assembly. Proceed down the false trailing edge installing the remaining ribs and glue them to the false trailing edge only at this time.



□ Step 23

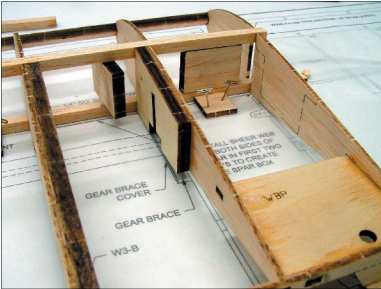
Glue the leading edge in place at W-1 and W-5. Then adjust each rib to seat in the slots in the leading edge and glue them. Now glue the ribs to the bottom spar. When gluing W-1 and W-2, only glue to the sides of the spar, not the top.





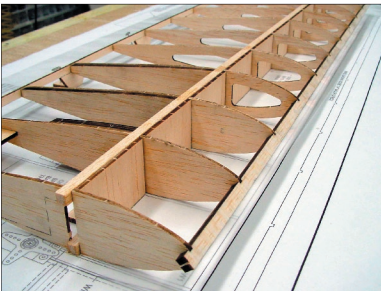
#### ❑ Step 24

Carefully remove the material between the top and bottom spar notches at W-1 and W-2. The spar opening has been laser cut but a small amount of material will have to be cut to make this opening.



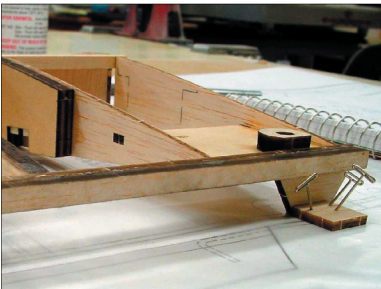
#### ❑ Step 25

Install the top spar and use the spacers provided when gluing to W-1 and W-2. Apply a bead of medium CA to all wing joints at this time.



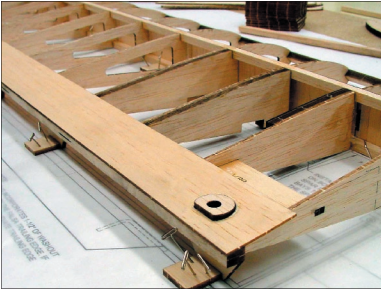
#### ❑ Step 26

Add the 3/32" sheer webbing the full length of the wing at the front of the spar. Add 3/32" sheer webbing between W-1, W-2 and between W-2, W-3 to the back of the spar. This will form the spar box.



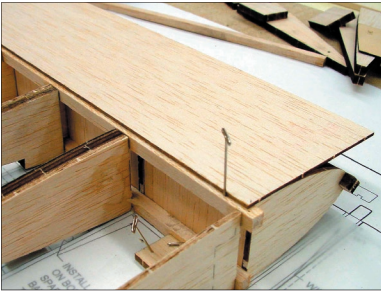
#### ❑ Step 27

Install the 1/4" wing bolt seat onto the wing bolt plate. You will also add one of these to the bottom of the wing later, do not shape these to the contour of the wing. They will provide a perfectly flat surface at 90° to the bolt orientation for seating the wing mounting bolt.



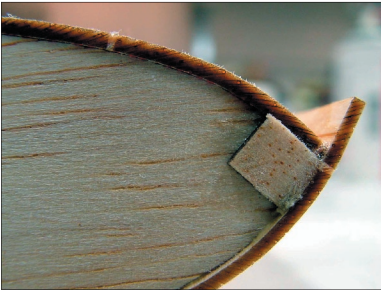
#### □ Step 28

Glue on the laser cut 1/4" trailing edge, make sure the laser cut hinge slots are facing aft and the root and tip are oriented correctly. The root has a larger slot cut for the aileron linkage installation. Sand the trailing edge and false trailing edge to the contour of the wing and then add the 1/16" balsa trailing edge sheeting.



#### □ Step 29

Mark the exact center of the top spar and insert a pin at each end at that location. Use medium CA to glue the leading edge sheeting along the entire length of the top spar using the pins to align it. Do not apply any glue to the ribs at this time. We will do that in the next step.



#### □ Step 30

Remove the wing assembly from the building board and snap off the pinning tabs and breakaway feet on the false trailing edge. Starting at the center of the wing lay the leading edge sheeting against the ribs and glue it. Lay the sheeting flat on the leading edge and glue it in that position. When finished,

trim off the excess sheeting flush with the leading edge. Turn the wing assembly over and repeat steps 28, and 29. When installing the bottom leading edge sheeting apply aliphatic resin glue to the each rib from the spar to the leading edge, but not the leading edge. Use medium CA to glue the sheeting to the main spar and then proceed by pulling the sheeting flat against the leading edge and gluing with CA as you did on the top sheeting. When finished the leading edge should look like the photo.

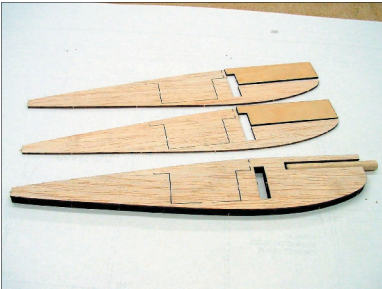
Put this wing half aside and repeat steps 20 through 30 for the remaining wing half.



### □ Step 31

Assemble the 1/4" ply main gear mount and the 1/8" ply main gear mount retainer plate. The end of the slot in the retainer plate aligns with the hole in the main gear plate. Install this assembly into the notches provided in WGB, W3-B and W-4-B. The end of the assembly with the hole in it should be pointing toward the

root of the wing. Add some triangle stock gussets to the top of the landing gear block as shown.



### NOTE:

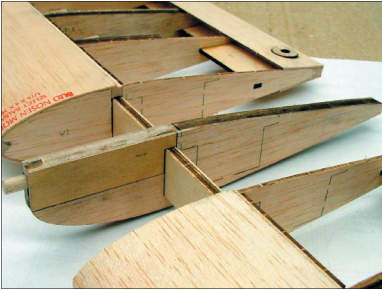
The wing joiner is assembled from six parts, they are the 1/4" core, two 1/16" balsa sides, two 1/16" ply sides and a 2-1/2"x 1/4" dowel. This assembly performs several functions, in addition to aligning the wing incidences it provides a secure elevated mount for the wing dowel and also serves to support the aileron servo.

A knockout for the aileron servo opening has been cut into all the required parts. When assembling the wing joiner, do not allow adhesive to get into the knockout cuts. If you do they will be difficult to remove. You can use thin CA to firm up all these parts after the knockout has been removed.



### □ Step 32

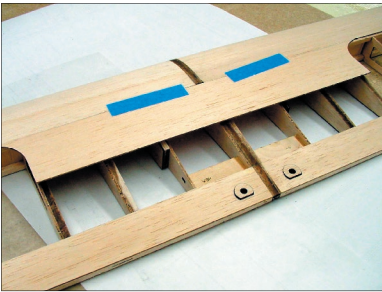
When assembling the wing joiner, use a generous amount of Epoxy to install the wing dowel and the wing dowel cap. Use adhesive sparingly around the servo knockout cuts.



### □ Step 33

Assembly sequence of the wing joiner. Apply Epoxy in the spar box, on the spar, to the joiner and ribs forward of the spar and to the joiner and ribs at least 1" behind the servo knockout. Make sure both wing halves align at the trailing edge and secure in that position with pins until cured. Long strips of masking

tape pulled taught along the leading and trailing edge sheeting work great for pulling the wing halves together.



### □ Step 34

Install the forward bottom center section sheeting next. In this photo, the openings for the landing gear blocks have not been cut, They are now laser cut into the bottom forward center section sheeting and it need only be placed in position and glued.



### □ Step 35

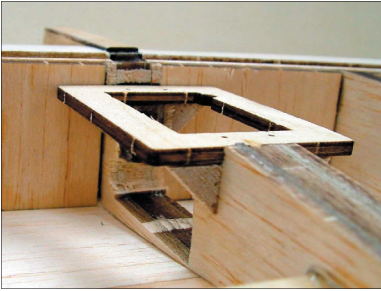
The top and bottom center section sheeting has been cut slightly oversized to accommodate variations in positioning of the leading and trailing edge sheets by the builder. Butt the back sheet up against the trailing edge sheeting and mark where they overlap, trim and install.



### □ Step 36

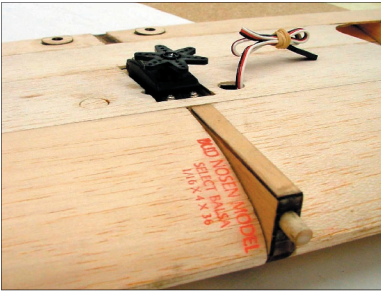
Trim the retainer tabs on the servo knockout and remove the material at the center of the wing joiner. This works best if you remove the material one layer at a time. After removal, harden this area with some thin CA.





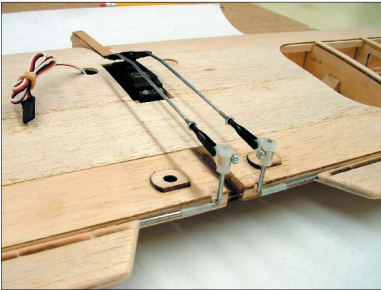
#### ❑ Step 37

Glue the aileron servo tray into position and brace it with some triangle stock gussets as shown. NOTE: Not shown here, install the two sheet support rib sections to the top of the servo tray along both sides of the servo opening. These supports look like the drawing below.



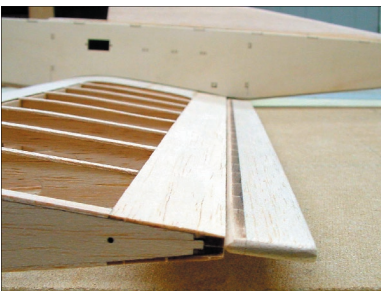
#### ❑ Step 38

Install the top sheeting and then temporarily install the aileron servo. The top sheeting has holes cut into it for the servo and the servo cable exit. You will need to enlarge the servo hole to accommodate your servo.



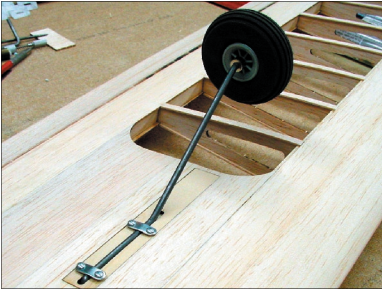
#### ❑ Step 39

Assemble the ailerons and aileron leading edges, sand to shape and then test install the hinges and the aileron linkage. The aileron horn bearing will need to be trimmed some to avoid hitting the wing bolt plate. Then Epoxy in place. NOTE: All hinge slots are laser cut but you will need to increase the depth of these slots by about 1/8".



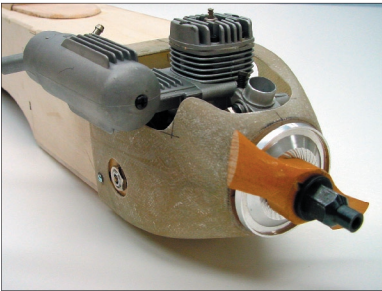
#### ❑ Step 40

Aileron installation should be straight and tight. Allow only a minimum gap between the wing and the aileron for smoothest aileron effect. Permanently attach only after covering.



#### ❑ Step 41

Du-Bro steel landing gear straps are used to retain the landing gear leg.



#### ❑ Step 42

When opening up the cowl, give the motor plenty of space for cooling air. This is a fiberglass cowl fabricated for the prototype model. Install the mounting screws so they screw into the 1/4" ply firewall and then harden the holes with CA.



#### ❑ Step 43

Installation of the servo's. Note that the center push rods utilize a Z-bend to maintain a low profile to allow space for the aileron servo. Make sure all linkages are snug with no play. Note that a small amount of material was removed from the fuselage doubler to allow clearance for the throttle linkage connector block. Temporarily install all linkages, the motor and the fuel system before covering. You may have to remove a small amount of material at the corner of the firewall for muffler clearance depending on your choice of motor.