

# F4U-4 Corsair

KIT # K-308

## Assembly Instructions



**NOTE:** 3 bladed prop is for display only. Use APC 9 X 3.8 SF Propeller while operating model.

*Designed by Tom Herr*

### **WARRANTY**

Alien Aircraft Corp. guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. In no case shall Alien Aircraft Corp.'s liability exceed the original cost of the purchased kit. Further, Alien Aircraft Corp. reserves the right to change or modify this warranty without notice. The quality and flyability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.

In that Alien Aircraft Corp. has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability. If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and unused condition to the place of purchase.

### **WARNING!!!**

Failure to follow these safety precautions may result in severe injury to yourself and others.

Use safety glasses when running the motor. Do not run the motor in an area of loose gravel or sand; the propeller may throw such material in your face or eyes. Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you run the motor. Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop. Always remove the LiPo battery from the plane before charging. Always use a charger designed to charge LiPo batteries for charging the LiPo flight battery. Never leave the LiPo battery unattended while charging. If the battery becomes more than just warm, discontinue charging.



## Alien Aircraft Corp.

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# Notes about the laser cut parts

1...The first thing that you need to do is to identify and mark the part numbers on the laser cut parts using the drawings on the following pages as a guide.

2...It is possible that several of the laser cut parts may not be completely cut through. If this is the case you can free the part from the sheet quickly using an X-acto knife.

3...The slight discoloration on the edges of the laser cut parts may be removed by lightly sanding the edges with 400 grit sandpaper.

## Kit Contents:

Your kit contains the following parts. Please check your kit for any missing or damaged parts before starting construction.

### Wood Bag:

Qty. ....	Name .....	Description
1 .....	LC-308-01 .....	.1/16" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-02 .....	.1/16" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-03 .....	.1/16" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-04 .....	.3/32" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-05 .....	.3/32" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-06 .....	.3/32" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-07 .....	.1/8" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-08 .....	.1/8" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-09 .....	.1/8" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-10 .....	.1/8" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-11 .....	.1/8" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-12 .....	.1/8" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-13 .....	.1/8" X 4" X 24" Laser Cut Balsa
1 .....	LC-308-14 .....	.3mm X 4" X 24" Laser Cut Poplar Ply
1 .....	LC-308-15 .....	.3mm X 4" X 24" Laser Cut Poplar Ply
1 .....	LC-308-16 .....	.3/32" X 4" X 12" Laser Cut Balsa
1 .....	LC-308-17 .....	.1/16" X 3" X 12" Laser Cut Birch Ply
1 .....	LC-308-18 .....	.1/16" X 3" X 12" Laser Cut Birch Ply
1 .....	LC-308-19 .....	.1/32" X 3" X 12" Laser Cut Birch Ply
3 .....	Wing Sheet .....	.1/16" X 3" X 12" Balsa
1 .....	K-308 PLAN A	
1 .....	K-308 PLAN B	
8 .....	Main Wing Spars .....	.3/32" X 1/4" X 12" Balsa
4 .....	Wing Leading Edges .....	.1/4" sq. X 12" Balsa
14 .....	Fuselage Stringers .....	.1/8" sq. X 36" Balsa
12 .....	Stringer Spars .....	.3/32" sq. X 24" Balsa
5 .....	Trailing Edge .....	.1/16" x 3/4" x 18" Balsa

### Hardware Bag

Qty. ....	Name .....	Description
4 .....	Blind Nuts .....	4-40 Blind Nuts
1 .....	Elevator Joiner .....	.1/8" x 3" Birch Dowel
4 .....	Control Horn .....	Control Horns
4 .....	C/A Hinges .....	Hinges
18 .....	Aileron Servo & L/G Screws .....	# 2 X 1/2" Sheet Metal Screws
1 .....	Tailwheel Reinforcement .....	.1" X 1 1/2" Nylon Tape
1 .....	Tail Wheel Wire .....	.1/16" x 8" Tail Wheel Wire
2 .....	Landing Gear Blocks .....	.3/8" Hardwood Blocks
1 .....	Wing Dowel .....	.3/16" X 1 1/2" Dowel
1 .....	Tailwheel Retainer .....	Nylon Wheel Retainer
1 .....	Wing Attach .....	.8-32 Nylon Screw
1 .....	Wing Attach .....	.8-32 Blind Nut
1 .....	Tail Wheel Wire Bearing .....	1/16" x .3" Aluminum Tube

### Kit Contents:

Your kit contains the following parts. Please check your kit for any missing or damaged parts before starting construction.

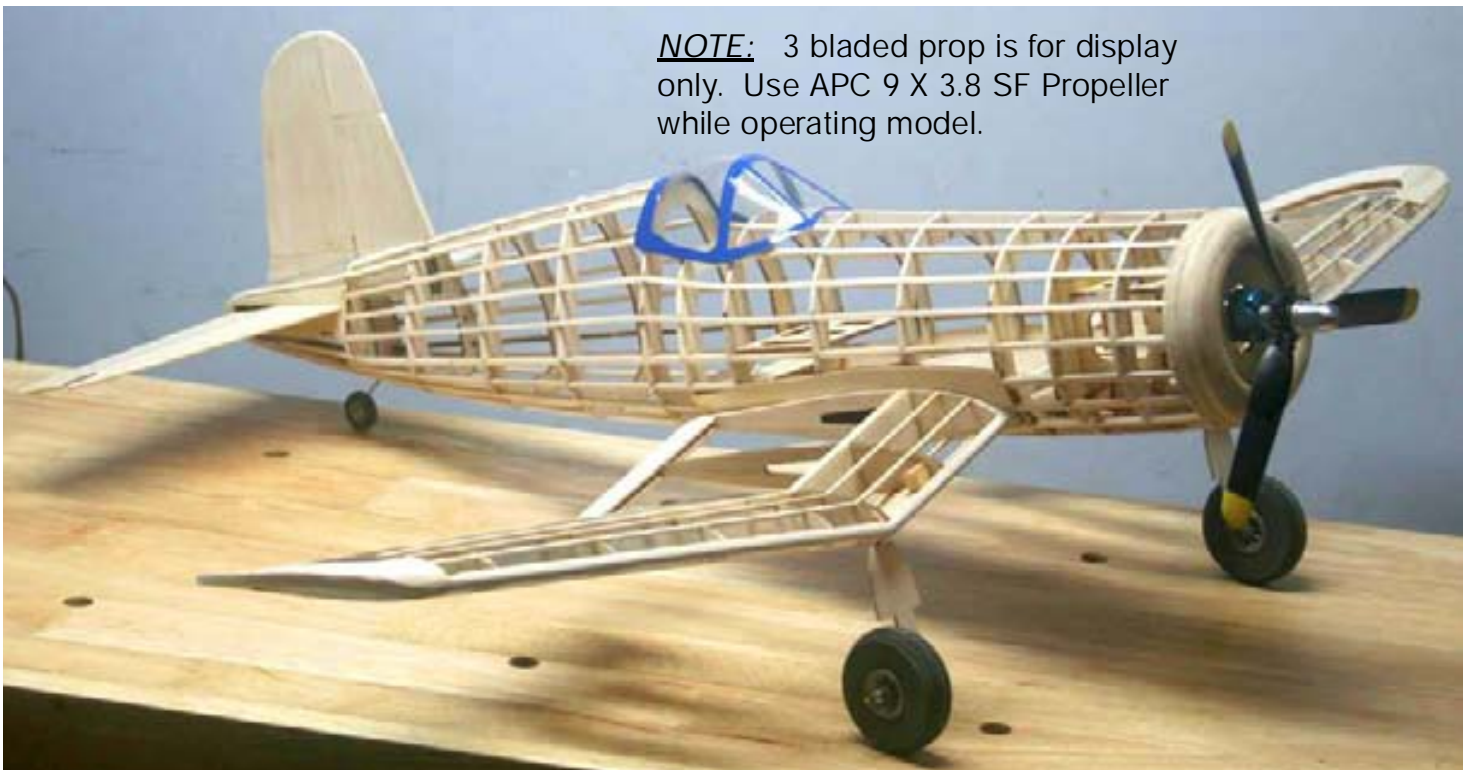
### Misc. Loose Parts

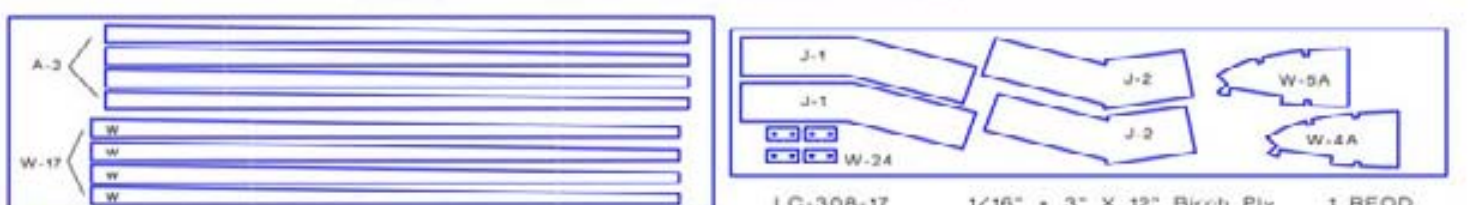
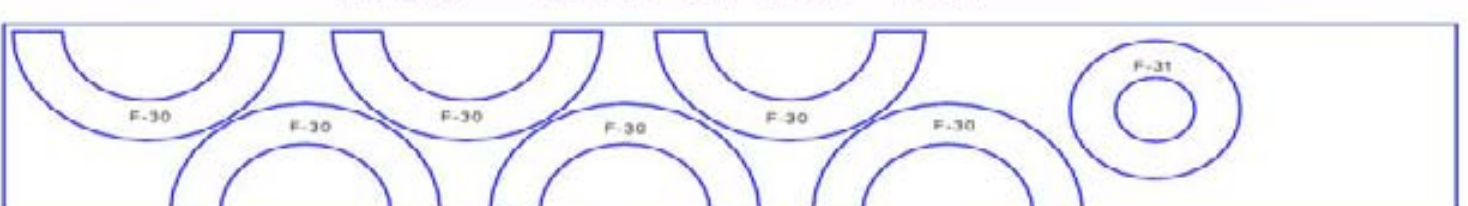
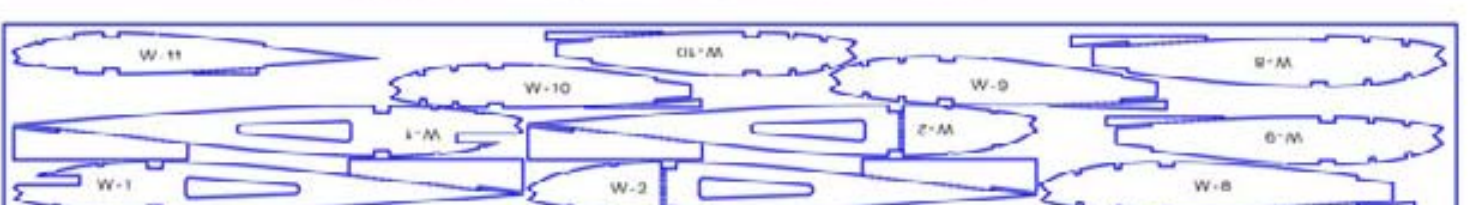
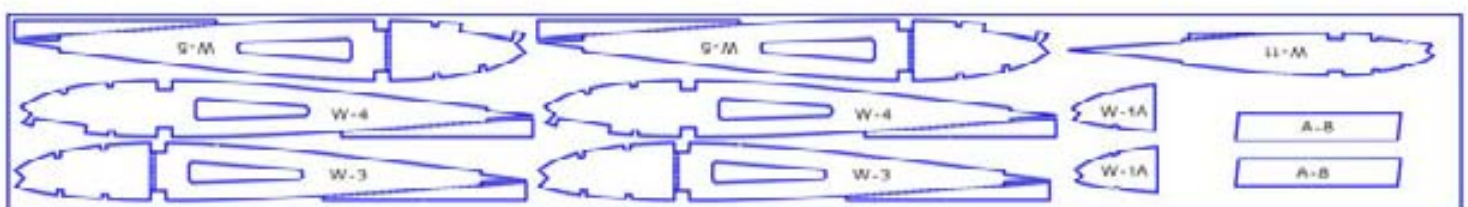
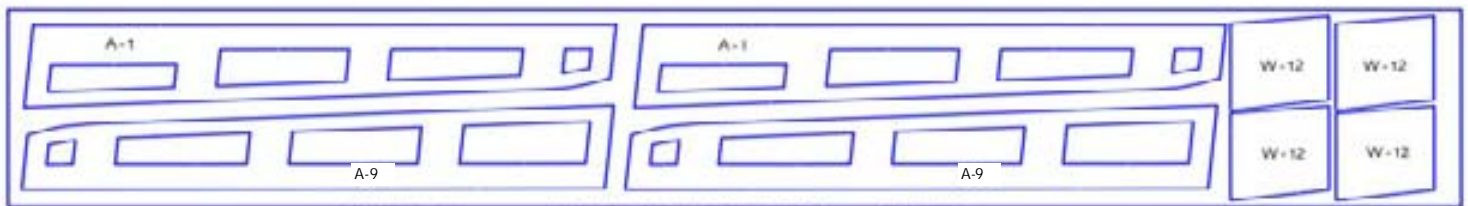
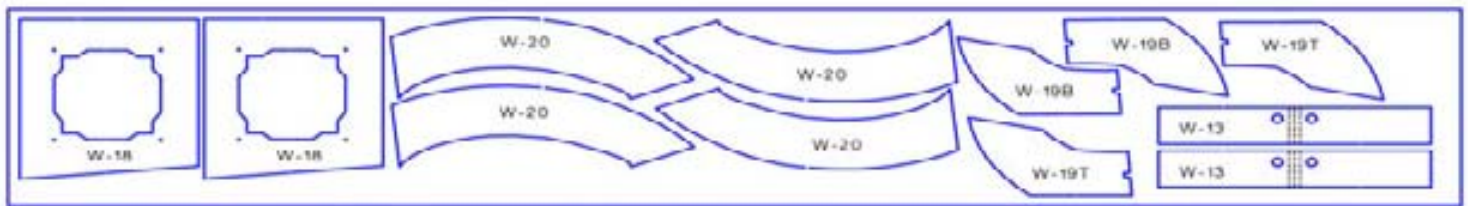
Qty.	Name	Description
2	K-308 Decal Sheet	
1	K-308 Plastic Canopy	
2	K-308 Main Landing Gear	

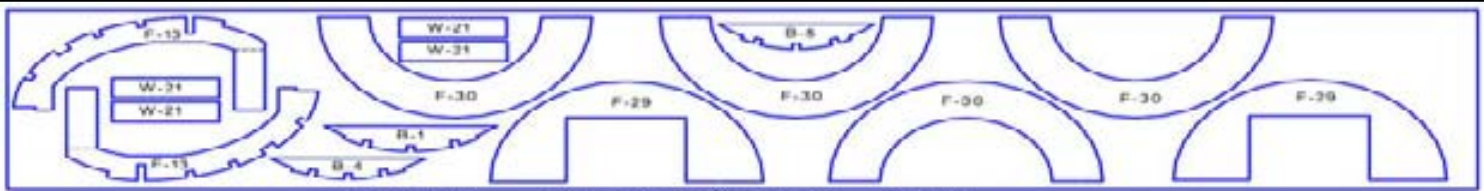
### Additional Items Required ( Not Included in Kit)

Note: These are parts that we have used and are familiar with. There are many other brands available and you may substitute other items that you are more comfortable with or have on hand.

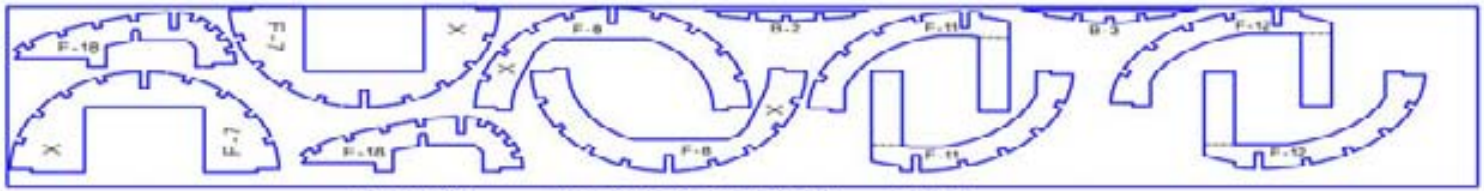
Qty.	Name	Description
1	Motor	Himax HC2816-0890 Brushless Motor ( Alien Aircraft P/N: AE-035)
1	Speed Control	Castle Creation Thunderbird-18 Electronic Speed Control ( Alien Aircraft P/N: AE-019) with connectors matching motor & battery
1	Battery Connector	Male Deans Ultra connector ( Alien Aircraft P/N: AE-027)
1	Heat Shrink Tube	.3/16" Heat Shrink Tube ( Alien Aircraft P/N: AE-029)
2	Tail Pushrods	Dubro Micro Pushrod Set ( Alien Aircraft P/N: AH-001)
2	Aileron Pushrods	Alien Aircraft 5" pushrod set ( Alien Aircraft P/N: AH-012)
1	Propeller	APC 9 X 3.8 SF Propeller ( Alien Aircraft P/N: AE-036)
1	Velcro	.6" Velcro ( Alien Aircraft P/N: AE-012)
4	.2816-0890 Motor Mount Screws	.4-40 X 1/2" Machine Screws ( Alien Aircraft P/N: AE-037)
2	Main Wheels	DuBro 2 1/2" Super Lite Lite Wheels (DuBro # 250SL)
1	Tail Wheel	DuBro 1" Mini Lite Wheel (DuBro # 100MW)
2	Wheel Collars	DuBro 3/32" Wheel Collars (P/N: #138)
1	Battery	.3 Cell 1250Mah to 1800mAh 20C Lipo Battery
1	Covering Material	Light Weight Covering Material Plus Trim Colors
1	Radio	.4 Channel Radio with 4 micro servos & Receiver with one "Y" connector and servo extensions if required.







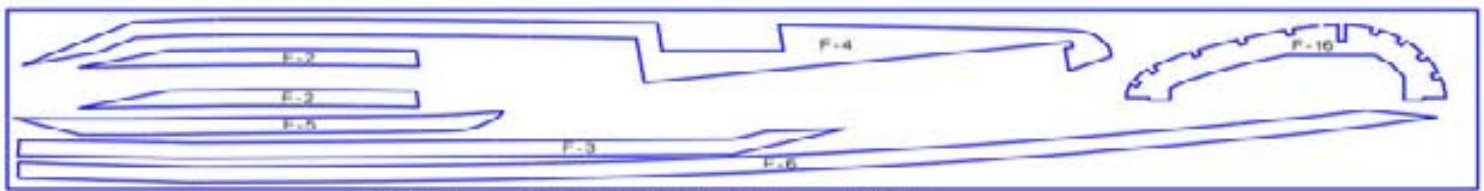
LC-308-08 1/8" X 4" X 24" BALSA 1 REQD.



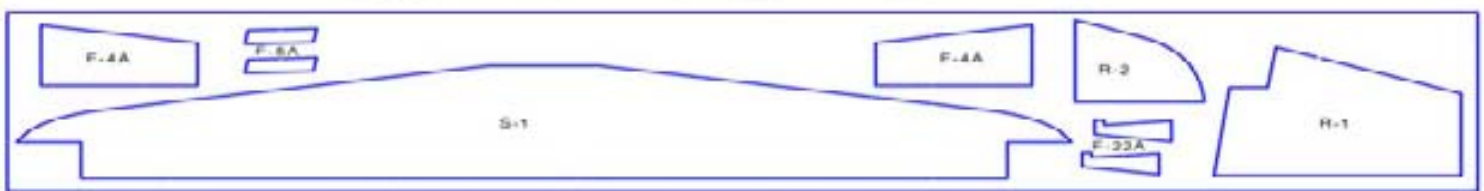
LC-308-09 1/8" X 4" X 24" BALSA 1 REQD.



LC-308-10 1/8" X 4" X 24" BALSA 1 REQD.



LC-308-11 1/8" X 4" X 24" BALSA 1 REQD.



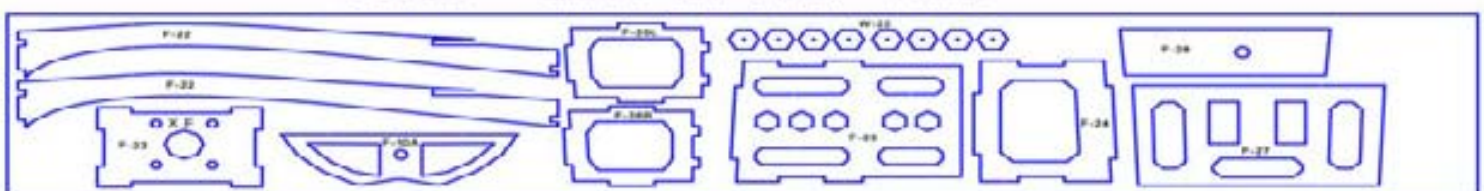
LC-308-12 1/8" X 4" X 24" BALSA 1 REQD.



LC-308-13 1/8" X 4" X 24" BALSA 1 REQD.



LC-308-14 3mm X 4" X 24" Lite Ply 1 REQD.



LC-308-15 3mm X 4" X 24" Lite Ply 1 REQD.



LC-308-18 1/16" X 3" X 12" Birch Ply 1 REQD.



LC-308-19 1/32" X 3" X 12" Birch Ply 1 REQD.

## Building Instructions:

General Note: Cover the plans with wax paper before assembling your model to prevent the parts from sticking to the plan.

### **Building the Tail Surfaces:**

1... Glue R-2 and R-3 together. Bevel the front edge of R-3 as shown on the plan, and sand the other edges round.



Mark the hinge locations and cut the hinge slots in R-1 and R-3. Temporarily install the hinges without glue. Sand the front edge of R-1 & R-2 round. Leave the other edges square.



Drill a 1/16" hole in the front of the rudder for the tail wheel wire. It should be located at the location shown on the plan.

2...Tightly wrap and glue the 1" nylon tape reinforcement into position around the front of R-3. Trim any excess and sand the tape smooth.



3... Join the elevators (S-2) using the 1/8" x 3" dowel. Use the stabilizer as a guide. Bevel the front edge of the S-2's as shown on the plan, and sand the other edges round.

Sand the front and ends of the stabilizer (S-1) round. Leave the back edge square.

Mark the hinge locations and cut the hinge slots. Temporarily install the hinges without glue.



## Building the Fuselage:



4...Make the two master stringers by gluing the F-1's and F-2's together over the drawing on the plan.



5...Pin keel pieces F-3 - F-6 into position on the fuselage plan as shown and glue them together.



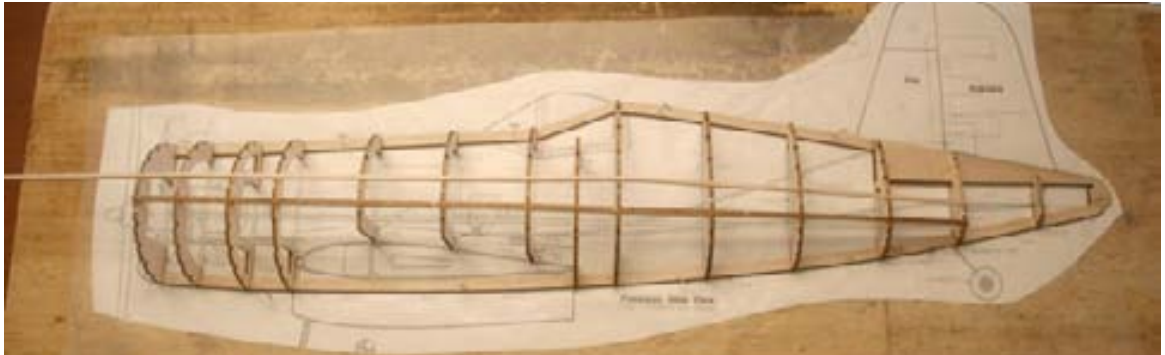
6...Glue F-4A onto F-4 as shown .



7...Place formers F-7 thru F-20 into position. Be sure you use F-9L for the left side. All other formers are the same for the left and right sides. These formers should be 90 degrees to the building board. When properly positioned, glue them in place. Pin the bottom of F-11, F-12, F-13 and the top of F-14 securely in position on the plan. Some of the formers have a small "X" on them. This marks the top so that you do not glue any of the formers on upside down.



8...Place F-1/F-2 master stringer into position on the formers. Working from the back to the front, glue it to the formers. Make sure all of the formers maintain a 90 degree angle to the building board.



9...Glue the 1/8" sq. stringer in place immediately above the master stringer. It extends from F-19 at the rear and forward to F-7. You can leave the front end long, to be cut off later.

10..Trim a taper on F-21L as shown. The angle extends from the marked line and tapers to a point at the back edge.

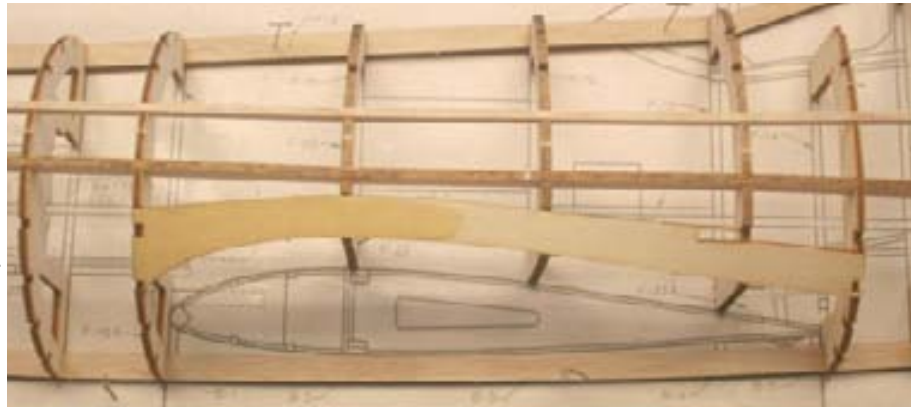


11...Place F-21L into position on the fuselage as shown with the taper down. The front end fits in the notch and is flush with the front of F-19. When properly positioned, glue F-21L in place.

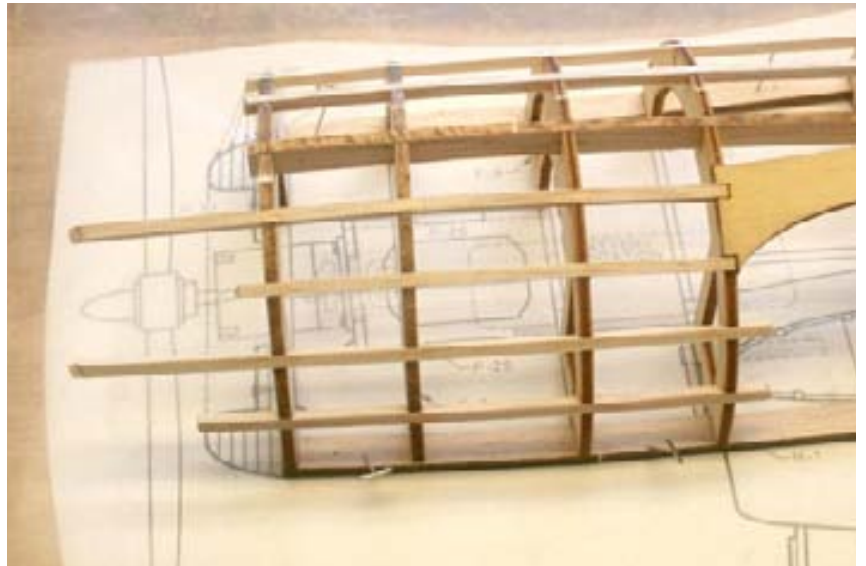




12...Moisten both sides of the front half of F-22 with an ammonia based glass cleaner such as Windex and allow it to sit for several minutes. Place it into position on the fuselage. Working from the back to the front, glue F-22 securely to the formers. Bend / roll the front end down so it fits tight in the notches in F-11 and F-10.



12...Place the next 1/8"sq. full length stringer into position on the fuselage directly above the previous one. The back ends in the notch in F-21. When properly positioned, glue the stringer in place. Leave the front end long, extending past F-7.



13...Cut, fit and glue the four lower front 1/8" sq. stringers into position as shown. Use the excess cut off from the previous two. Cut the remaining from a 1/8" sq. x 36" piece. Leave the front ends long, extending past F-7. They will be trimmed flush with the former later.



14...Glue a short 1/8" sq stringer between F-13 and F-15. It should be located in the bottom of the notches in the formers.



15...Cut, fit and glue the two upper front 1/8" sq. stringers into position between F-13 and F-7 as shown. Leave the front ends long, extending past F-7. They will be trimmed flush with the former later.



16...Cut, fit and glue the three top rear 1/8" sq. stringers into position as shown. The top stringer ends against the front of F-19. The second stringer extends all the way back and is glued to F-21 and the keel. The lower stringer ends in the notch in F-21.



17...Cut, fit and glue the four lower rear 1/8" sq. stringers into position as shown. The bottom and third stringer from the bottom extend all the way back to the keel. The second and top stringer end against the front face of F-19. Then add the short stringer from the notch in F-19 and ends against the front of F-20.

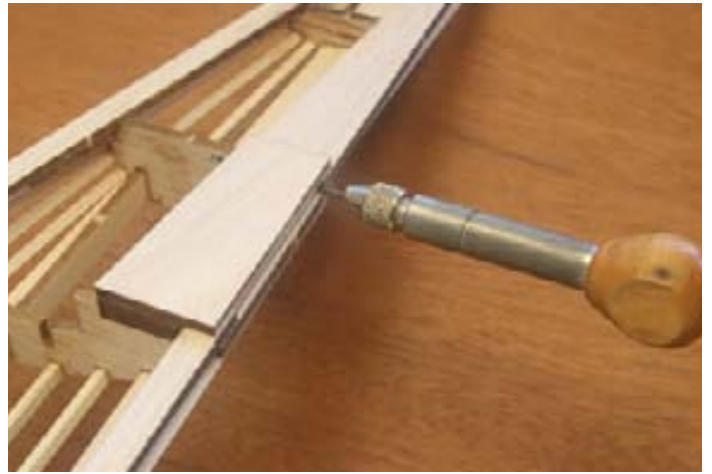
18...Remove the fuselage from the plan. Glue F-4A to the right side of the keel.



19...Glue F-5A to the right side of the keel just in front of F-19.



20...Using a 1/16" drill, drill down thru the slot between the F-4A's thru F-4. The drill should be centered and tight against the back of the fin slot.



21...Cut a slot 3/32" wide and 3/32" deep in the right side of F-5 immediately in front of F-19 as shown.



22...Bend the bottom end of the tail wheel wire as shown on the plan.



23...Slide the 1/16" aluminum tube onto the long end of the tail wheel wire. Insert the wire into the hole in F-4 from the bottom. Press the aluminum tube into the slot in F-5. Twist the tail wheel wire to make sure that it moves freely. Make adjustments if there is any binding.



Remove the wire carefully while holding the tube in place. Carefully glue the tube into position making sure not to get glue inside the tube.

Glue F-5A to the left side of F-5, trapping the tube in place.

When the glue is dry, temporarily replace the wire to test for proper movement, then remove the wire. Use a 1/16" drill to clear any glue from the tube if required.



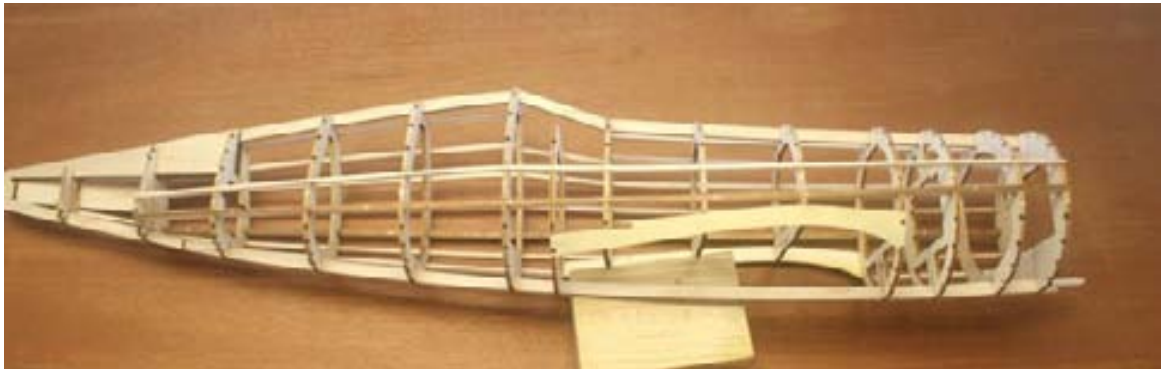
24...Place formers F-7 thru F-20 into position on the right side of the fuselage. These formers should match the 90 degree angle of the formers on the opposite side. When properly positioned, glue them in place. Be careful to not glue any formers in upside down.



25...Place the master stringer into position on the formers. Working from the back to the front, glue it to the formers. Make sure that the formers stay at 90 degrees to the keel.

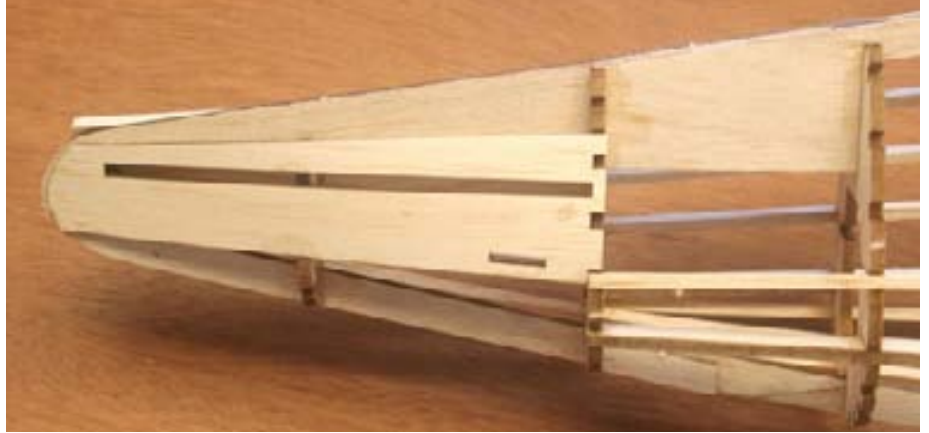
26...Moisten both sides of the front half of F-22 with an ammonia based glass cleaner such as Windex and allow it to sit for several minutes. Place it into position on the fuselage. Working from the back to the front, glue F-22 securely to the formers. Bend / roll the front end down so it fits tight in the notches in F-11 and F-10.



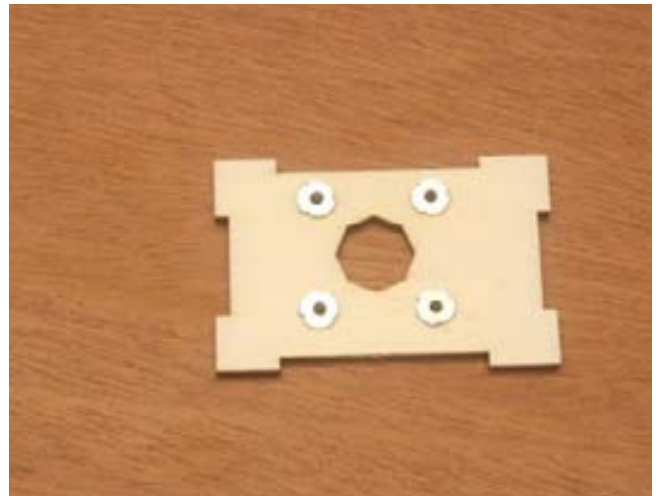


27...Glue the 1/8" sq. stringer in place immediately above the master stringer. It extends from F-19 at the rear forward to F-7. You can leave the front end long, to be cut off later.

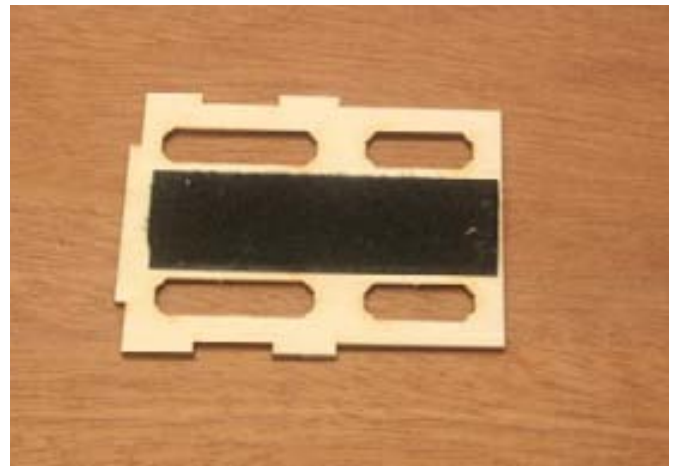
28...Taper the back of F-21R and place it into position on the fuselage as shown with the taper down. The front end fits in the notch and is flush with the front of F-19. When properly positioned, glue F-21R in place.



29...Press four 4-40 blind nuts into the back of F-23. Use a small drop of thin C/A to secure them in place.



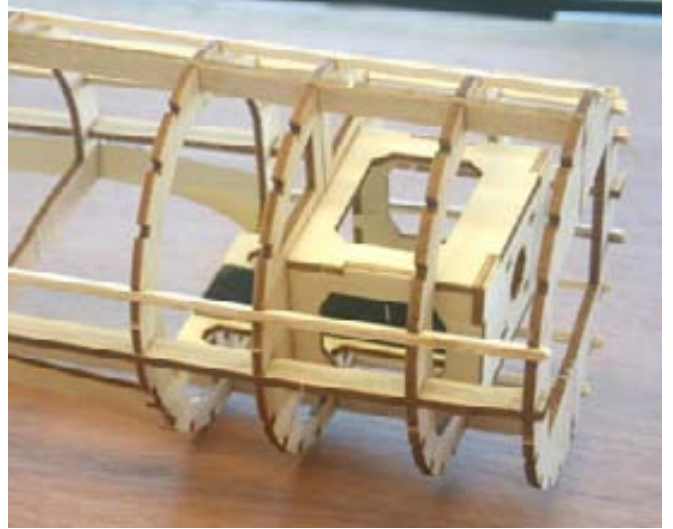
30...Glue a strip of velcro to the top of F-25. Be sure the front edge angles back on the right side as shown. This is because there is right thrust in the motor that is set by the angle of the firewall.



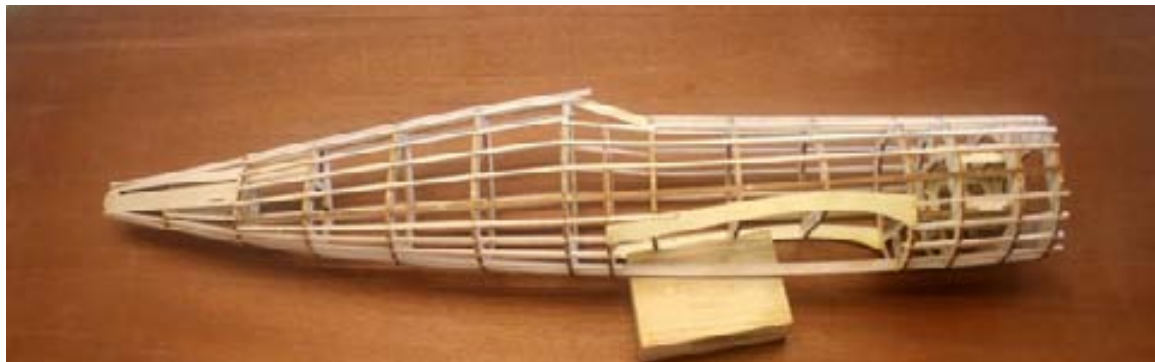
31...Assemble and glue the the motor mount / battery box as shown using parts F-23, F-24, F-25 and F-26L&R. The firewall (F-23) should angle down and to the right. Use several small applications of thin C/A glue until it stops soaking into the plywood.



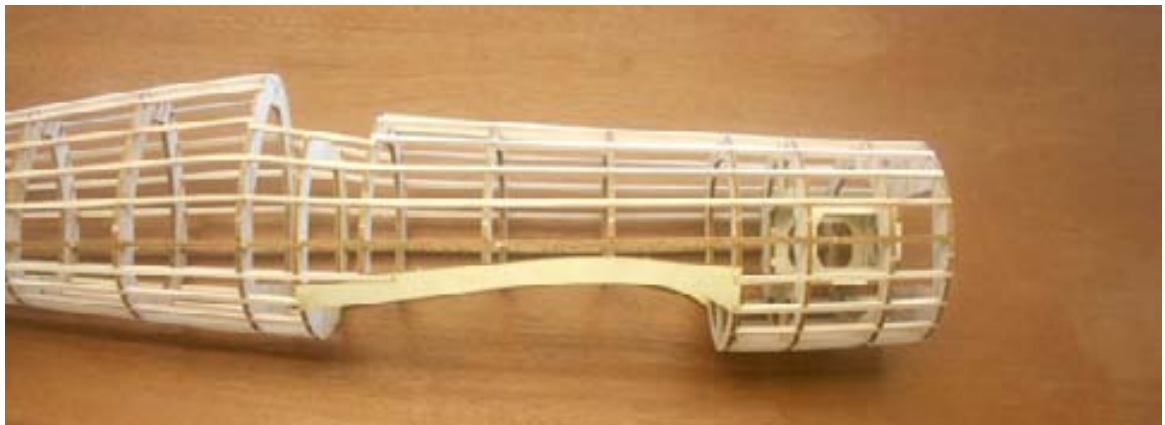
32...Position the motor mount assembly in place on the front of F-9 by sliding it into the fuselage from the front. Make sure that it is completely seated and glue in place to F-9 and F-10 with several applications of thin C/A glue until it stops soaking into the plywood.



33...Place F-10A on the front of F-10. Align the 3/16" holes in both parts with the wing dowel. Remove the dowel and glue F-10A securely in place.



34...Fit and glue the 1/8" sq. stringers into place as you did the opposite side.



35...Trim the top keel flush between formers F-13 and F-15. Trim the bottom keel flush between formers F-10 and F-14. Trim the stringers and sand flush with the formers.



36...Trim the bottoms from formers F-11-F-13. Trim the top from former F-14.



37...Glue the two F-22A's into position on the insides of the F-22's.

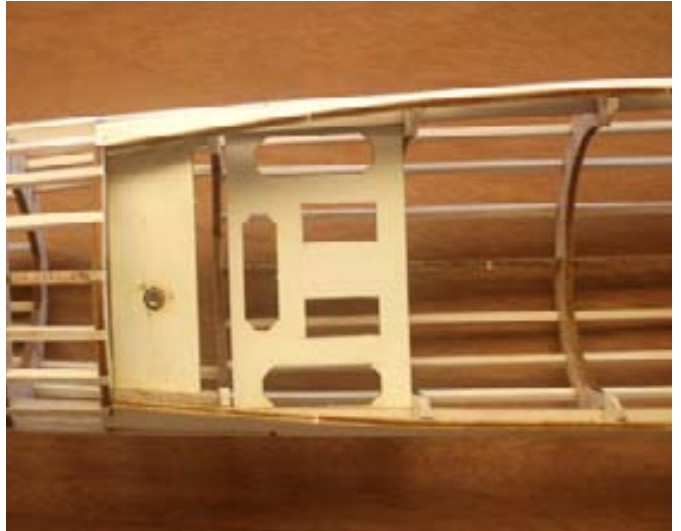
38...Press the 8-32 blind nut into F-28. Use a small drop of thin C/A to secure it in place. The hole is not centered and it doesn't matter which side you place the blind nut in.



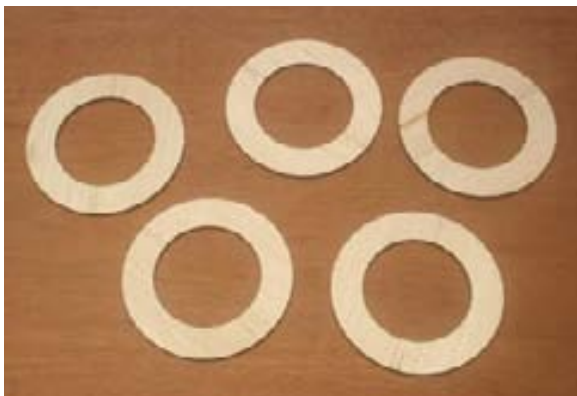
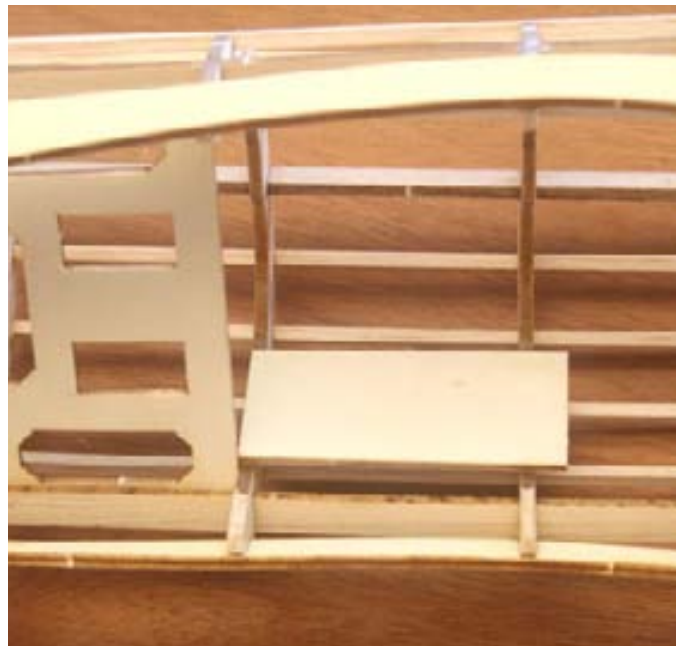
39...Glue F-28 into position on top of the F-22-A's.



40...Glue F-27 into position on the top of the master stringers.



41...Glue the F-32 receiver mount into position on formers F-11 and F-12. It can be on either side of the fuselage.

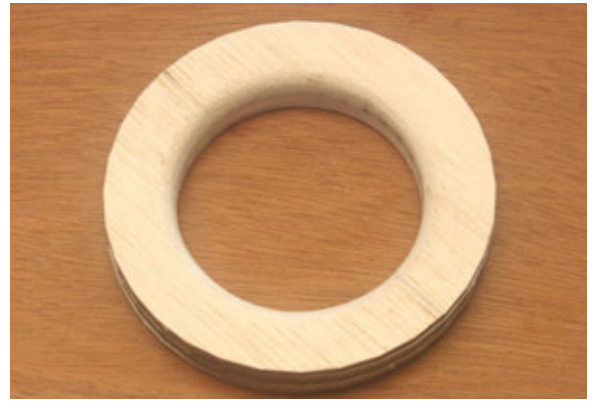


42...Glue the F-30 cowl rings together and then glue the rings together in a stack.





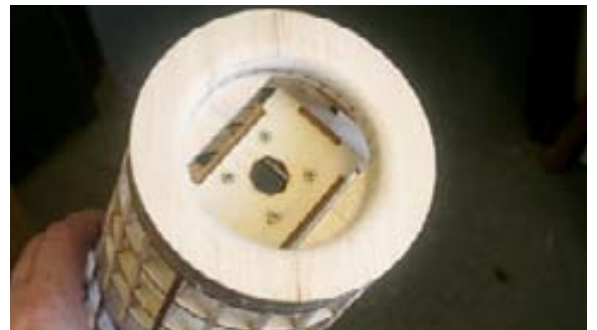
43...Sand the inside of the cowl smooth and round the front inside corner as shown.



44...Glue the two F-29's together. Now glue the F-30's to the F-29.



45...Glue the cowl to the front of the fuselage. The hole in F-29 should be aligned with the hole in F-7 and the outside should be even.



46.....Cut a piece of scrap 1/8" balsa sheet to fit between the two top stringers on the right side of the fuselage in front of front of F-19 and glue it in place.



47...Sand the fuselage smooth all over. Sand the outside curve on the outside of the cowl. Sand and shape the back end of the fuselage.

## **Building the Wing:**

Note: Cover the wing plan with wax paper to prevent the parts from sticking to the plan.

## **Building the Center section:**

*Note: the center section is built upside down.*

48...Glue two  $\frac{3}{32}$ " x  $\frac{1}{4}$ " x 18" balsa strips together to make the  $\frac{3}{16}$ " x  $\frac{1}{4}$ " main spar.

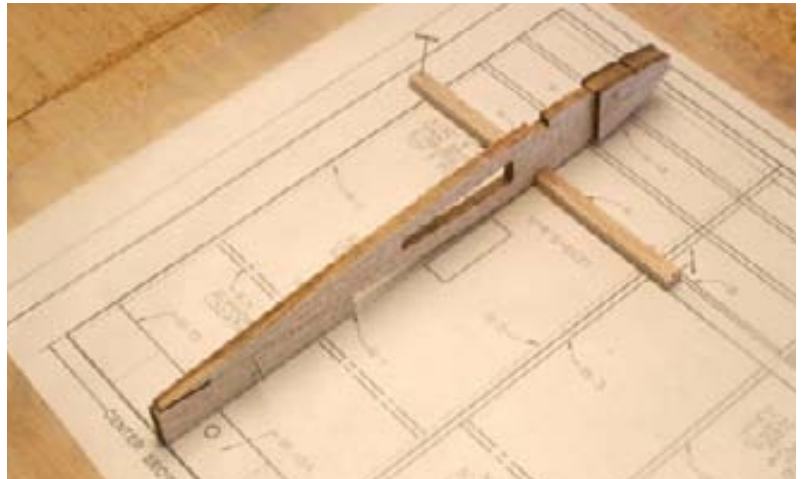
Cut a piece of this spar 5" long. Pin it to the plan. it will be longer than needed, so center it so an equal amount extends past each W-2 rib.



49...Glue the two W-1 ribs together. Glue the W-1A doublers to each side of the front of rib W-1



50...Pin and glue rib W-1 into position on the bottom spar 90 degrees to the building board.



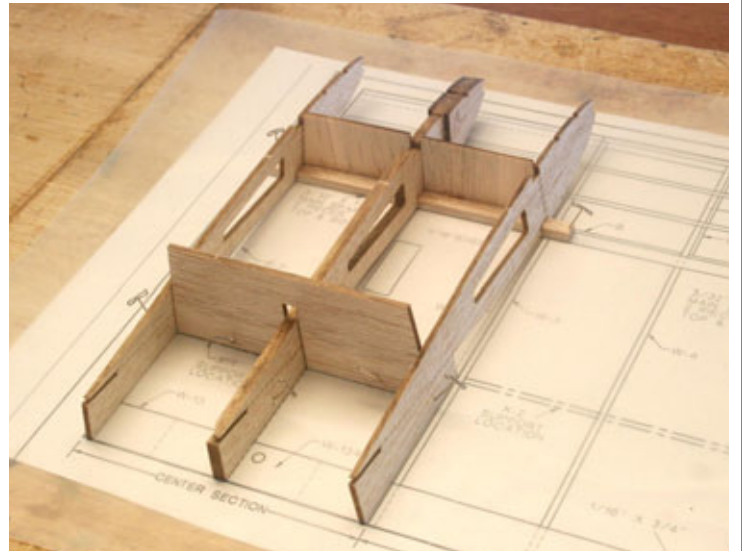
51...Place shear webs "A" into position and glue to the front face of the spar.



52...Pin the rear brace "X-1" into position over W-1 at the location shown on the plan. Do not glue to the rib.



53...Glue ribs W-2 into position. They should be tight against shear web "A" and the rear brace. They should be glued to the spar and shear webs but not the rear brace.



54...Cut another piece of the 3/16" x 1/4" spar 5" long. Glue it into position so an equal amount extends past each W-2 rib.



55...Slide the bottom trailing edge sheet (W-13) into position in the slots in the back end of the ribs. The ends will be slightly long and extend past the W-2 ribs. Be sure the trailing edge is fully forward in the notches and glue in place.



56...Glue the top trailing edge sheet (W-13) into position.



57...Glue the 1/4" sq. balsa leading edge into position. Make sure that the leading edge is completely seated in the notches in the wing ribs.



58...Glue the 3/32" sq. stringer spars into position.



59...Remove the X-1 brace. Cut a piece from one of the 1/16" x 3" x 12" sheets. Use this piece to sheet the top wing center section. The sheet should be between and flush with the spars and the trailing edge.



60...Finish adding the top 1/16" center section sheet between the stringer spars, and between the forward stringer spar and the leading edge.



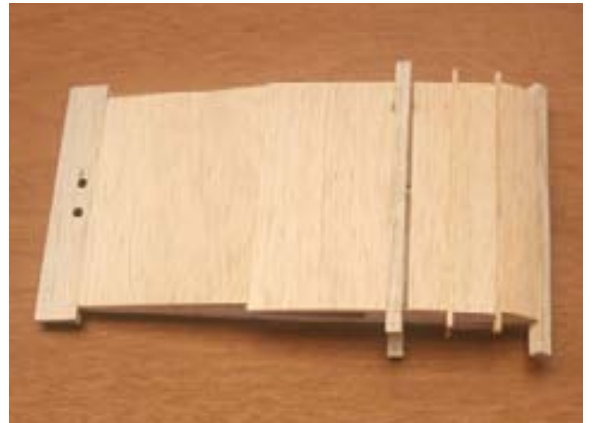
61...Remove the center section from the plan. Remove the support tabs from the back of the wing ribs. Insert the W-13A fillers between the trailing edge pieces and glue in place.



62...Install the lower 3/32" sq. stringer spars.



63...Sheet this side of the wing as you did the first side.



64...Trim the excess spars, sheet and trailing edges flush with the W-2 ribs. Sand the leading edge of the wing round to match the profile shown on the plan and sand the center section smooth all over.



65...Test fit the center section to the fuselage. Sand the fuselage and wing as required to achieve a good fit.



66...Cut the top sheet away from the dowel hole in the front of the W-1 ribs. Securely glue the dowel into position.



67...Test fit the wing to the fuselage. Adjust the dowel hole in F-10 if required to achieve the proper fit.



Drill the hole in the trailing edge that lines up with the blind nut if required. The other hole is not used. Temporarily install the wing bolt.

### **Building the inboard wing panels:**

Build the right inboard wing panel.

68...Cut one 3/32" x 1/4" x 18" strips into two 9" pieces. Glue the two pieces together to make the 3/16" x 1/4" main spar.



Cut this spar into two 4 1/2" pieces. Pin one to the plan. it will be longer than needed, so center it so an equal amount extends past ribs W-3 and W-5.

69...Glue W-4A to W-4 and W-5A to W-5. They should be oriented as shown so that when the ribs are installed in the wing, they face each other.



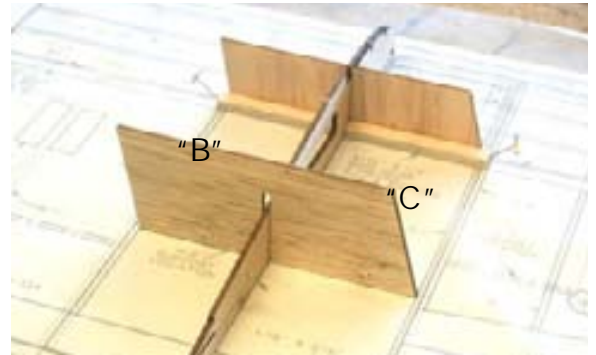
70...Pin and glue rib W-4 into position on the bottom spar 90 degrees to the building board. The W-4A doubler should face outboard.



71...Place shear webs "B" and "C" into position and glue to the front face of the spar.



72...Pin the rear brace "X-2" into position over W-4 at the location shown on the plan. Do not glue to the rib.



73...Glue rib W-3 into position. It should be tight against shear web "B" and the rear brace. It should be glued to the spar and shear web but not the rear brace.



74...Glue rib W-5 into position. It should be tight against shear web "C" and the rear brace. It should be glued to the spar and shear web but not the rear brace. The W-5A doubler should face the W-4A doubler.



75...Glue the other piece of the 3/16" x 1/4" x 4 1/2" spar into position on the top of the ribs so an equal amount extends past the W-3 and W-5 ribs.



76...Cut a piece of 1/16" x 3/4" x 18" balsa to make the lower trailing edge. Make it slightly long so that it extend past the W-3 and W-5 ribs. Be sure the trailing edge is fully forward in the notches and glue in place.



77...Cut and glue the top trailing edge into position.



78...Cut and glue the 1/4" sq. balsa leading edge into position. Make sure that the leading edge is completely seated in the notches in the wing ribs.



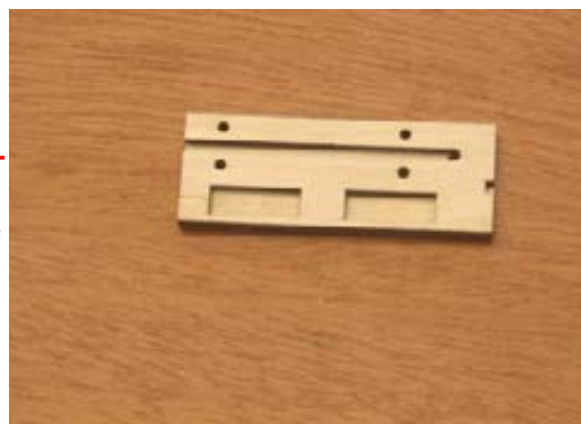
79...Glue the 3/32" sq. stringer spars into position. When the glue is dry, remove the wing panel from the plan.



*Carefully remove the X-2 brace and save it for building the opposite panel.*



80...Glue a set of W-14, W-15 and W-16 together to make the landing gear mount. **Note: These pictures show the assembly for the right side. Make a mirror image assembly to make the landing gear mount for the opposite side as shown on the plan.**





81...Tightly position the landing gear mount into the notches in the W-4 and W-5 ribs and glue in place.



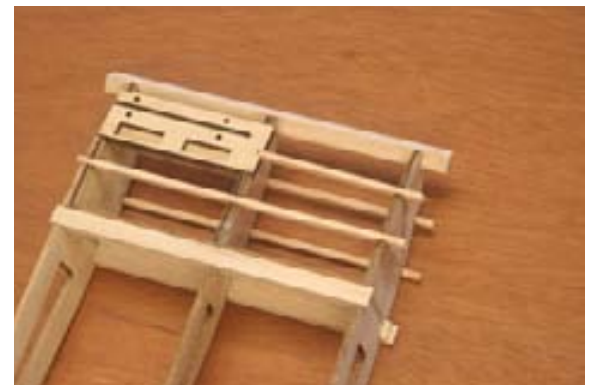
82...Glue a 3/8" hardwood cube into place in the corner of the W-5A rib and the landing gear mount. The cube should be centered on the 3/32" hole in the landing gear mount.



83...Cut a 1" piece of 1/4" sq. balsa and securely glue into place in the corner of the W-4A rib and the landing gear mount. Sand or trim to angle it for a tight fit.



84...Glue the 3/32" sq. stringer spars into position.



85...Trim the excess spars and trailing edges flush with the W-3 and W-5 ribs. Sand the leading edge of the wing round to match the profile shown on the plan and sand the panel smooth all over.



86...Drill a 3/32" hole thru the hardwood cube using the hole in W-14 as a guide. Be sure to hold the drill 90 degrees to the landing gear mount.

Repeat steps 68 thru 86 to build the opposite inboard wing panel.



### **Building the outboard wing panels:**

Build the right outboard wing panel.

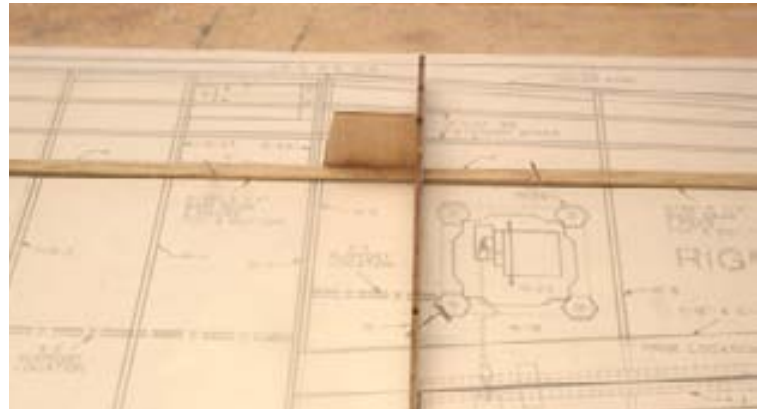
87...Pin one 3/32" x 1/4" x 18" main spar to the plan. The inboard end will extend past the W-6 rib. The outboard end stops at the W-11 rib.



88...Pin and glue rib W-7 into position on the bottom spar 90 degrees to the building board.



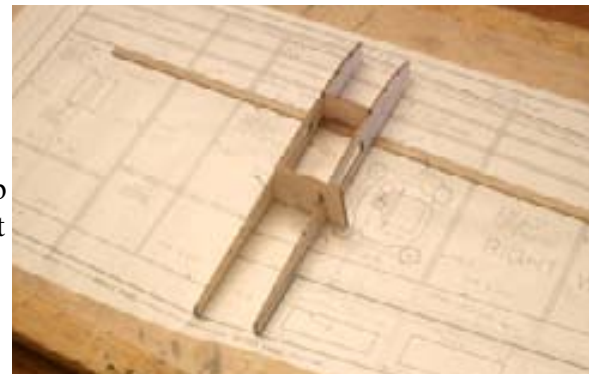
89...Place shear web "D" into position and glue to the front face of the spar.



90...Pin the rear brace "X-3" into position over W-7 at the location shown on the plan. Do not glue to the rib.



91...Glue rib W-6 into position. It should be tight against the shear web and the rear brace. It should be glued to the spar and shear web but not the rear brace.



92...Pin and glue ribs W-8 thru W-11 into position on the bottom spar 90 degrees to the building board.



93...Slide the bottom 1/16" x 3/4" x 18" trailing edge sheet into position in the slots in the back end of the ribs. The inboard and outboard ends will be long and extend past the W-6 and W-11 ribs. Be sure the trailing edge is fully forward in the notches and glue in place.



94...Slide the bottom W-12 trailing edge sheet into position in the slots in the back end of the W-6 and W-7 ribs. Be sure it is fully forward in the notches and glue in place.



95...Glue the top main spar into place. the outboard end stops at the W-11 rib.

Glue the shear web "E" into position on the front faces of the main spars.



96...Glue the 1/4" sq. balsa leading edge into position.



97...Glue the 3/32" sq. stringer spars into position. The out-board end stops at W-11 and the inboard ends will be long extending past W-6.



98...Glue two W-17's together to make the aileron spar.



99...Glue the aileron spar into position between ribs W-7 and W-11. Sand the ends slightly if required to get the proper fit. Be sure it is tight against the back of the ribs and the trailing edge sheet.



100...Cut and glue the top trailing edge into position.



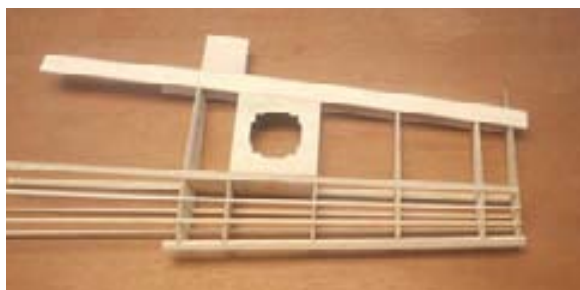
101...Glue the top W-12 trailing edge into position.



102...Remove the wing from the plan. Break or cut off the support tabs from the lower back end of the ribs.



Glue W-18 into position between the spar and the trailing edge, on top of ribs W-7 and W-8.

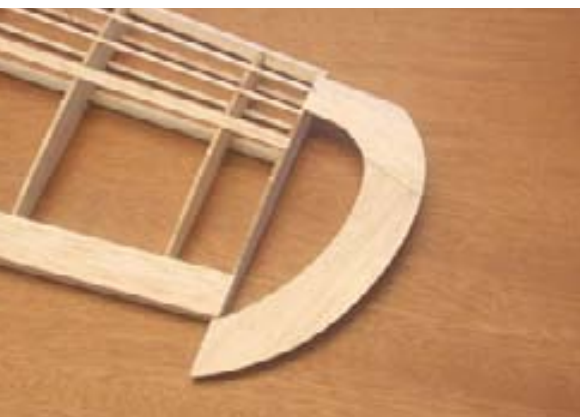


103...Glue the 3/32" sq. stringer spars into position. The outboard end stops at W-11 and the inboard ends will be long extending past W-6.

Trim the excess spars, sheet and trailing edges flush with the W-6 and W-11 ribs.



104...Glue the top W-19T and W-20 together to make the top wing tip. Glue the bottom W-19B and W-20 together to make the bottom wing tip.



105...Glue the top wing tip into position onto rib W-11. It should be level with the top spar and match the curve of rib W-11. Slightly moisten the top surface with windex if required to allow it to curve properly.



106...Glue the bottom wing tip into position onto rib W-11. Lay the wing upside down on your building board. Hold it so it is level front to back. Press the lower wing tip sheet into contact with the top sheet and press both into contact with the building board. The bottom will be a little short but that is OK.



Put a drop of glue at the very center of the wing tip to glue the bottom to the top. Then, working from the center to the rear glue the bottom wing tip to the top. Pinch the sheets together as required. Working from the center to the front, glue the bottom wing tip to the top.

107...Glue two W-21's into position against the top and bottom sheet and the 1/4" sq. leading edge.



108...Sand the leading edge of the wing round to match the profile shown on the plan. Sand the trailing edge and wing tip round. Leave the edges of the aileron cutout square. Now sand the wing smooth all over.



109...Glue the four W-22's into position on the inside of W-18 in the position shown on the plan. Align the holes in the W-22's with the holes in W-18.



Repeat steps 57 thru 109 to build the left wing.

## **Building the ailerons:**

Build the right aileron.

110...Glue two A-2's together to make the aileron leading edge.



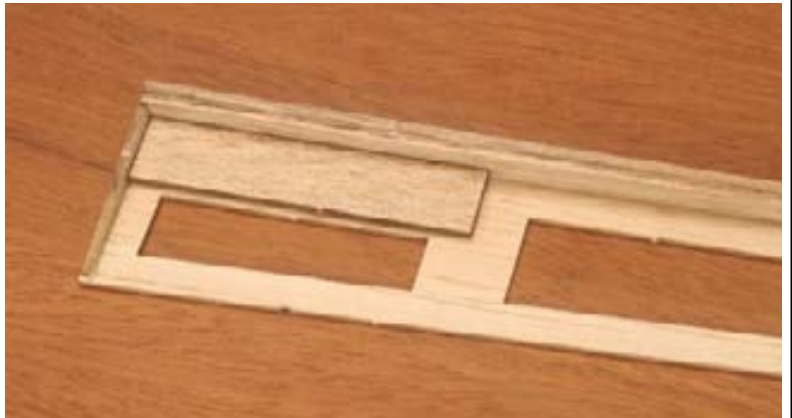
111...Glue the A-2 onto and flush with the front of A-1B.



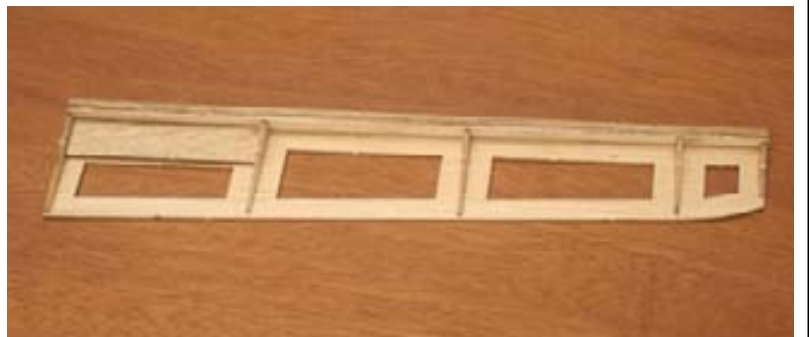
112...Position A-3 at the inboard end of the aileron. The edge should be flush with the end of A-1 and be tight against A-2. When properly positioned, glue in place.



113...Position A-8 at the inboard end of the aileron. The edges should be tight against A-2 and A-3. When properly positioned, glue in place.



114...Position A-4 thru A-7 as you did A-3. When properly positioned, glue in place.

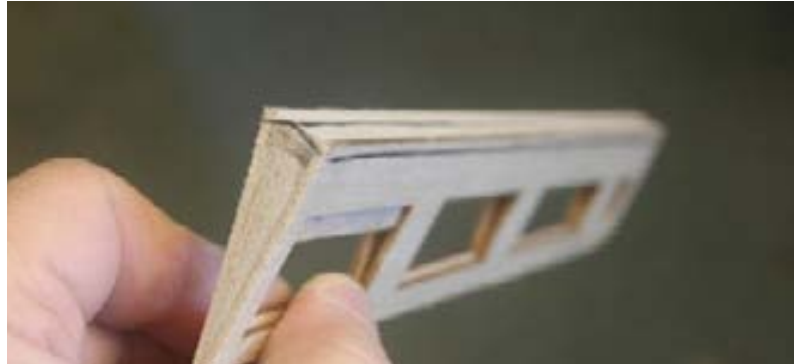


115...Trim or sand an angle on the top of the A-2's to match the angle of the ribs as shown on the plan.

Glue the top A-9 sheet in place.



116...Draw a line centered on the front of the aileron. Draw a line 1/8" back from the leading edge on the top and bottom of the aileron.



117...Use these lines as a guide to trim or sand the proper angles on the front of the aileron as shown on the plan.



118...Mark a centerline on the back of the aileron spar (W-17) on the wing. Mark the hinge locations and cut slots in the wing and ailerons for the hinges.

Temporarily install the hinges and check the aileron for proper fit on the wing. Do not glue the hinges at this time.

119...Repeat steps 110 thru 118 to build the right aileron.

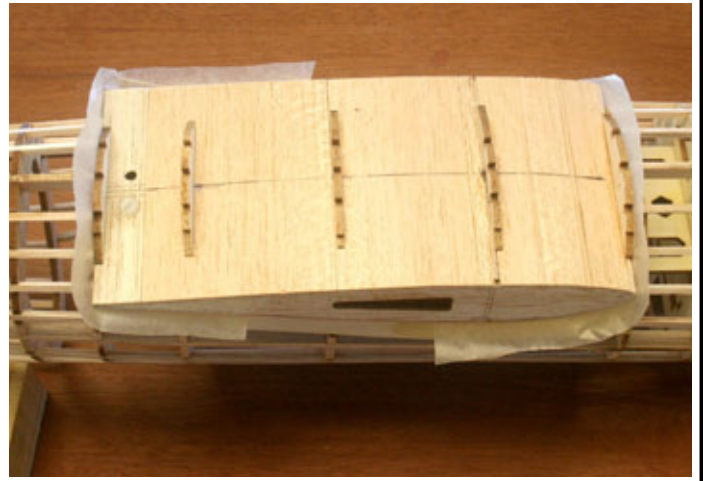


120...cover the front and back of the center section with wax paper and reinstall on the fuselage.

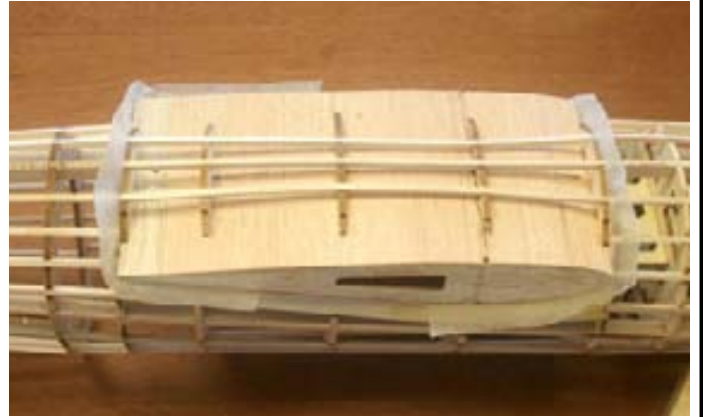




122...Mark the location of B-1 thru B-5 on the bottom of the wing. Glue B-1 thru B-5 onto the bottom of the wing. They should be vertical and be centered left and right.



123...Glue the three 1/8" sq. stringers in place.



124...Glue the two B-6's in place on the sides of the formers.



125...Cut a piece of scrap 1/8" sheet and glue it into position between the stringers in front of the wing bolt. It should extend slightly above the stringers.



126...Remove the wax paper from the assembly. With the wing securely attached with the screw, sand the bottom of the fuselage smooth and flush with the bottom of the fuselage.



127...Cut the holes in the top center section sheet for the aileron servo wire access in the location shown on the plan.



128...Cut slots in the end ribs at the dashed lines to accept the wing joiners.



129...Slide the wing joiners J-1 into the center section. Test fit the inboard panels to make sure that they fit properly. The J-1 joiners should be tight against the spars and tight against the back of the shear web. Glue the wing joiners into the center section with 5 minute epoxy. Use a small scrap of wood to spread the epoxy inside the wing on the spars and shear web. Spread a thin film of epoxy on the joiner and then insert it into the wing completely. Wipe off any excess glue that may squeeze out and allow the epoxy to dry.

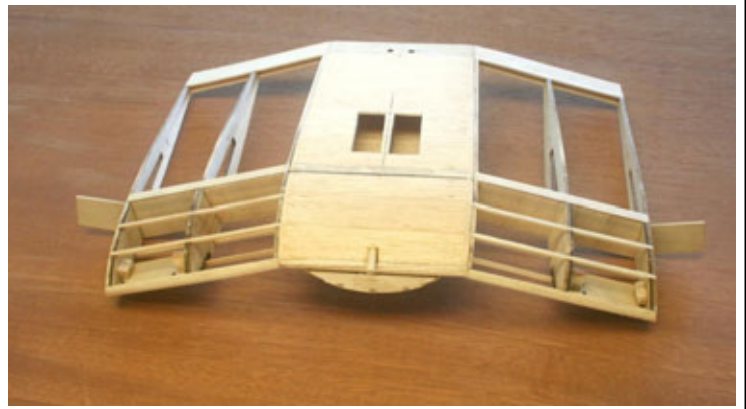


130...Test Fit the inboard panels on the center section.

Apply epoxy to the wing joiner and inside the wing. Spread glue on the W-2 ribs. Slide the wings together and align the W-2 and W-3 ribs. Wipe off any excess glue and hold the wings in the proper alignment with several strips of masking tape.



131...Slide the wing joiners J-2 into the inboard panels. Test fit the outboard panels to make sure that they fit properly. The J-2 joiners should be tight against the spars and tight against the back of the shear web. Glue the wing joiner into the wing with 5 minute epoxy. Use a small scrap of wood to spread the epoxy inside the wing on the spars and shear web. Spread a thin film of epoxy on the joiner and then insert it into the wing completely. Wipe off any excess glue that may squeeze out and allow the epoxy to dry.



132...Test fit the outboard panels to make sure that they fit properly.

Apply epoxy to the wing joiner and inside the wing. Spread glue on the W-5 ribs. Slide the wings together and align the W-5 and W-6 ribs. Wipe off any excess glue and hold the wings in the proper alignment with several strips of masking tape. Sand the top, bottom, leading edge and trailing edge to match each other.

### **Covering:**

136...Sand all parts smooth with 400 grit sandpaper. Feed strings from the aileron servo mounts to the center section. You will use these strings to pull the servo wires thru the wing after the model is covered. Cover the model with a light weight iron on covering material. Paint the canopy with paint designed for plastic models. We use Krylon Fusion spray paint. **DO NOT USE PAINTS SUCH AS Top Flite LustreKote. IT WILL DAMAGE THE PLASTIC PARTS.**

**Note:** For smoother looking covering, scallop the formers as shown on the plan. You can use a small piece of sandpaper wrapped around a small dowel to make the scallops.

**Note:** After the model is covered you must check the tail surfaces, wings and ailerons for warps or twists. If there are any they can be removed by twisting the parts straight and heating the covering.

### **Final Assembly:**

133...Cut the covering away from the stabilizer, fin and pushrod slots in the back end of the fuselage. Trim part F-20 away from the stabilizer slot.



134...Carefully cut the covering away from areas on the fin that will make contact with the fuselage. Place the fin into position and make sure that it is straight and square.



135...Insert the tail wheel wire into the fuselage from the bottom. It should turn freely. Trim the lower back edge of the fin to allow proper movement if required.



136...Using the rudder as a guide, Mark the bend location in the tail wheel wire.



137...Remove the fin. Bend the tail wheel wire 90 degrees at the marked location. It should be parallel to the lower leg of the tail wheel wire.



138...Glue the fin into position. Use care not to get glue on the tail wheel wire.



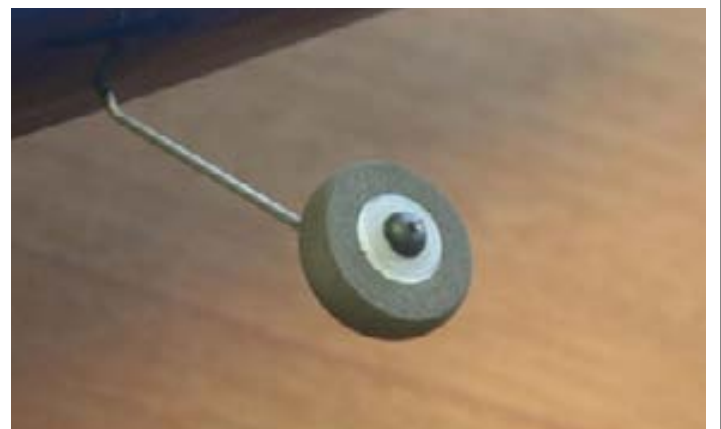
139...Attach the rudder with the hinges and glue in place. Glue the hinges with thin C/A and the wire with 5 minute epoxy.



140...Drill a hole in the filler between the stringers for the rudder pushrod. Insert the Rudder pushrod housing into the exit hole. It should extend out to about 1 1/2 " from the hinge lines. Glue the housing to the rear exit.



141...Attach the tail wheel with the press on retainer. Trim the axle as required to minimize any play in the tail wheel while still allowing it to rotate freely.



142...Attach the elevators to the stabilizer with the hinges and glue in place.



143...Cut the covering away from the stabilizer in the areas that makes contact with the fuselage. Place the stabilizer into position in the fuselage. Make sure that it is straight and square and then glue it into position. **NOTE: When trimming the covering, DO NOT cut into the wood. This will cause the tail surfaces to fail in flight.**



144...Insert the elevator pushrod housing into the exit slot in the back of the fuselage. It should extend out to about 1 1/2" from the hinge lines. Glue the housing to the rear exit.



145...Glue the elevator control horn into position. Drill 1/16" holes for the pins to pass thru. Trim the covering away from the wood in the area where the base of the control horn makes contact. When the glue is dry, cut off the excess pins flush.



146...Install the elevator pushrod into the housing from the rear. Secure the rear of the pushrod to the control horn with a Mini E/Z Link.

147...Glue the rudder control horn into position. Drill 1/16" holes for the pins to pass thru. Trim the covering away from the wood in the area where the base of the control horn makes contact. When the glue is dry, cut off the excess pins flush.

148...Install the rudder pushrod into the housing from the rear. Secure the rear of the pushrod to the control horn with a Mini E/Z Link.

149...Screw the rudder and elevator servos to the servo tray. Slide the F-14A pushrod support over the pushrod housings and back against F-14.

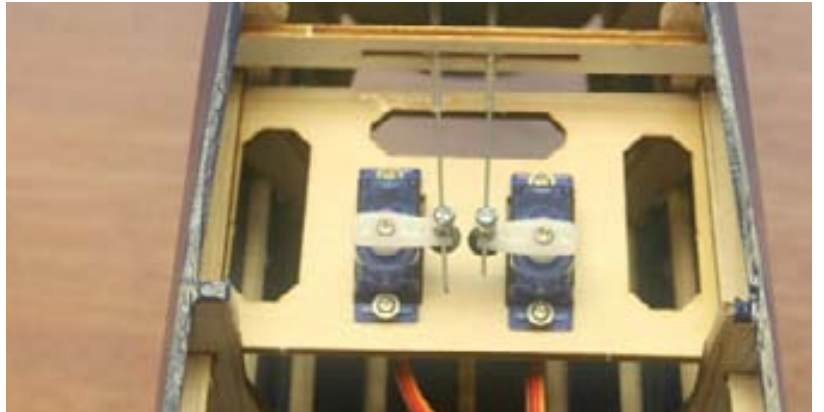
150...The front ends of the pushrods are attached to the servos with Mini E/Z Connectors. Trim the front ends of the pushrods 1/2" in front of the connectors when the control surfaces are in neutral.

Glue the F-14A pushrod support to F-14 and then glue the housings to the support.

151...Pass the motor wires from the speed controller out thru the hole in the front of the fuselage.

152...Plug the motor wires into the speed controller. Attach the motor to the model using 4-40 x 1/2" screws. Pull the speed controller and wires back into the fuselage.

153...Attach the front cover (F-31) to F-29 with two #2 sheet metal screws.



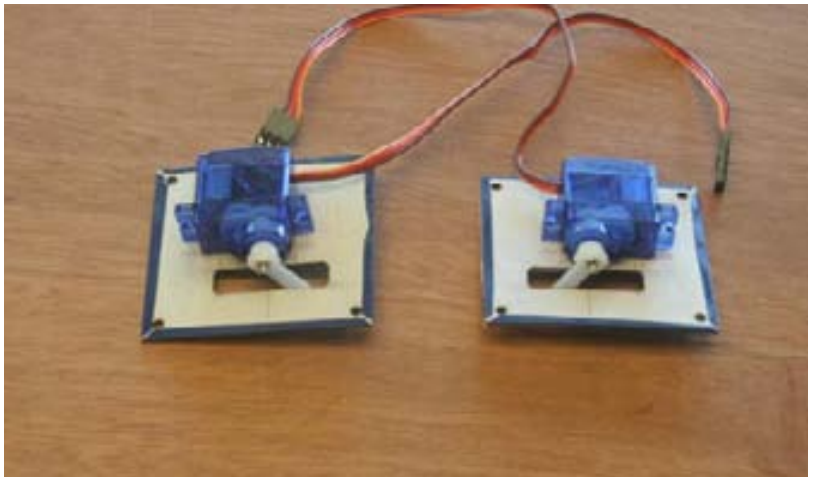
154...Glue a piece of velcro in place to mount the receiver. Mount the receiver to the fuselage. Plug the servos and speed controller into the receiver. We just let the speed controller hang from its wires.



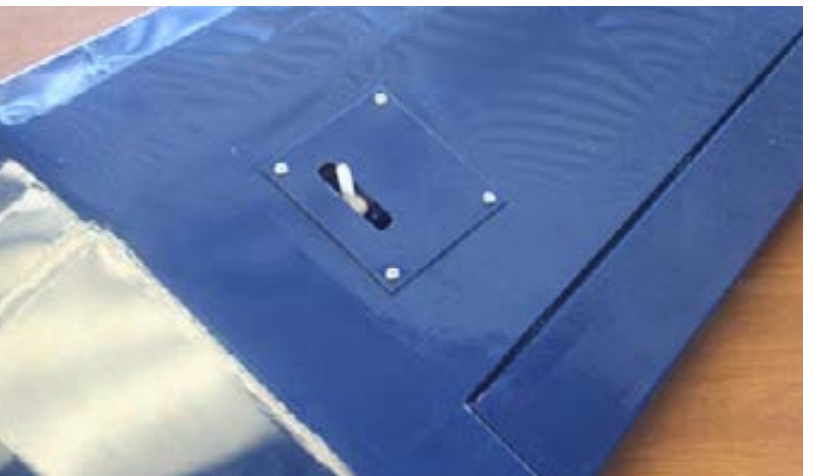
155...Attach the ailerons to the wings with the hinges and glue in place.



156...Glue the aileron servos into position on the W-23 mounting plates. The servo arms should be angled about 30 degrees forward to the plate when the servo is in neutral. Be sure to make a left and a right hand assembly.

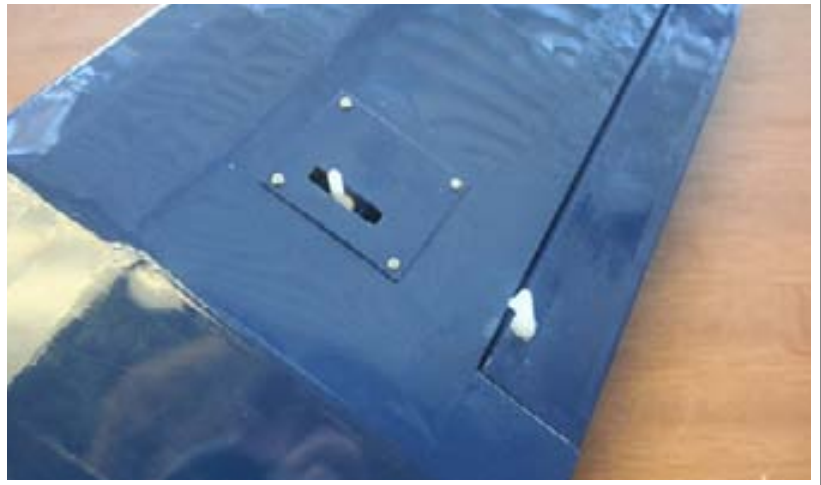


157...Screw the servo mount plates to the W-18's. The servo arms should be forward and inboard as shown. Use the strings in the wing to feed the servo wires through the wing and out the holes in the center section sheet.

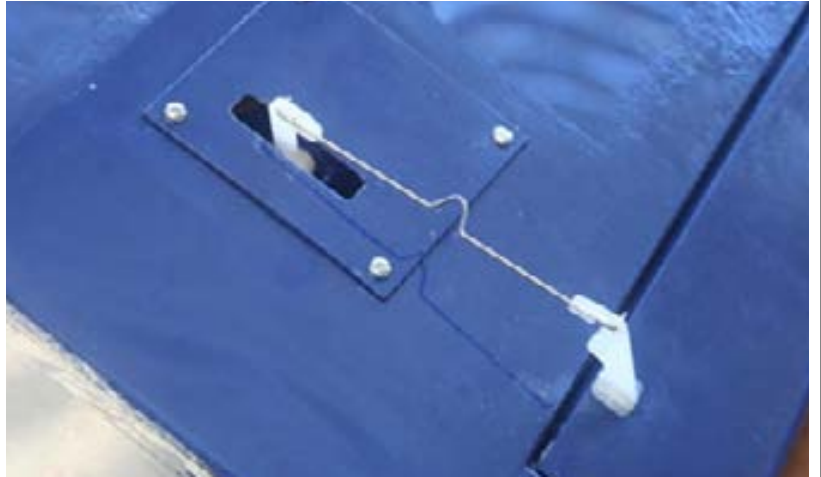




158...Glue the aileron control horns to the bottom of the ailerons in the position shown on the plan. Drill 1/16" holes for the pins to fit into.

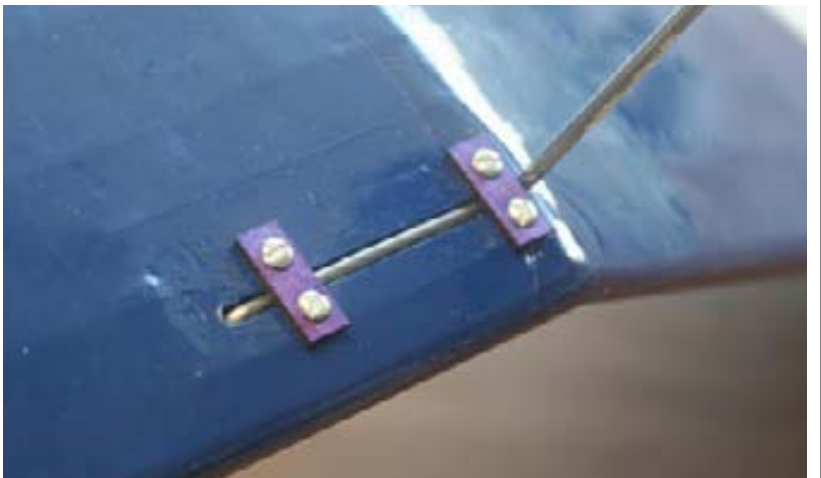


159...Bend the aileron pushrods to the shape shown on the plan.



Install the pushrods and attach them to the servos and control horns with Mini E/Z Links.

160...Secure the landing gear wires to the wing using the W-24 straps and the #2 sheet metal screws.



161...Adjust the bend on the top of the landing gear wire so the landing gear legs angle forward as shown on the plan. Make sure that the angle matches on the left and right sides.

162...Secure the wheels onto the landing gear legs with 3/32" wheel collars.



163...Epoxy the gear doors to the landing gear legs with 5 minute epoxy.



164...Trim the canopy on the trim lines. Test fit it on the fuselage.

165...Mask the clear areas on the canopy and paint the framework.

166...Place the canopy on the fuselage. Mark where the canopy contacts the fuselage. Cut away a small strip of covering from the wood areas to expose the wood. In the areas where the covering is not supported by wood, scuff up the covering. Using glue sparingly to attach the canopy to the fuselage.



167...**WITH THE PROPELLER REMOVED**...Turn the transmitter on. Place the throttle stick in the low position. Plug the battery into the speed controller. Check the motor for proper operation and direction of rotation. Follow the instructions with the speed controller to make any adjustments.

168...Attach the wing to the model and plug in the aileron servos using a “Y” connector. Check the servos for proper operation and direction. Adjust the control throws to the values shown on the plan. Now disconnect the battery and then turn off the transmitter.

169...Install the propeller on the model. Place the battery in the model.

170...Check the balance of the model. It should balance at the position shown on the plan. Move the battery forward or aft to achieve the proper balance. Use the velcro straps to secure the battery in the model in this position. Mark the location of the battery on the fuselage. This will allow you to quickly reinstall the battery at the location that gives the proper balance.

Note: If moving the battery will not achieve the proper balance, you will have to add weight to the nose or tail. Glue any weight securely to the model.

171...Your model is now ready to fly. Fully charge the transmitter and airborne battery before attempting to fly the model. Always range check and do a thorough pre-flight of the model before every flight. Always follow established safety guidelines while operating the motor, radio and flying your model.

## LIPO BATTERY SAFETY ALERT

### Lithium Battery Fires

Lithium batteries are becoming very popular for powering the control and power systems in our models. This is true because of their very high energy density (amp-hrs/wt. ratio) compared to NiCd's or other batteries. With high energy comes increased risk in their use. The principal risk is FIRE which can result from improper charging, crash damage, or shorting the batteries. All vendors of these batteries warn their customers of this danger and recommend extreme caution in their use. In spite of this, many fires have occurred as a result of the use of Lithium Polymer batteries resulting in loss of models, automobiles, and other property. Homes and garages and workshops have also burned. A lithium battery fire is very hot (several thousand degrees) and is an excellent initiator for ancillary (resulting) fires. Fire occurs due to contact between Lithium and oxygen in the air. It does not need any other source of ignition, or fuel to start, and burns almost explosively. These batteries must be used in a manner that precludes ancillary fire. The following is recommended:

1. Store, and charge, in a fireproof container; never in your model.
  2. Charge in a protected area devoid of combustibles. Always stand watch over the charging process. Never leave the charging process unattended
  3. In the event of damage from crashes, etc, carefully remove to a safe place for at least a half hour to observe. Physically damaged cells could erupt into flame and after sufficient time to ensure safety, should be discarded in accordance with the instructions which came with the batteries. Never attempt to charge a cell with physical damage, regardless of how slight.
  4. Always use chargers designed for the specific purpose, preferably having a fixed setting for your particular pack. Many fires occur in using selectable/adjustable chargers improperly set. Never attempt to charge Lithium cells with a charger which is not specifically designed for charging Lithium cells. Never use chargers designed for Nickel Cadmium batteries.
  5. Use charging systems that monitor and control the charge state of each cell in the pack. Unbalanced cells can lead to disaster if it permits overcharge of a single cell in the pack. If the batteries show any sign of swelling, discontinue charging and remove them to a safe place outside as they could erupt into flames.
  6. Most important: NEVER PLUG IN A BATTERY AND LEAVE IT TO CHARGE UNATTENDED OVERNIGHT. Serious fires have resulted from this practice.
  7. Do not attempt to make your own battery packs from individual cells.
- These batteries CANNOT be handled and charged casually such as has been the practice for years with other types of batteries. The consequence of this practice can be very serious resulting in major property damage and/or personal harm.

