

Super Dragon™

KIT # K-501

Assembly Instructions



Revision:01
09-07-12

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.



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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
2	.LC-501-01	.3mm X 5" X 24" Laser Cut POPLAR PLY
2	.LC-501-02	.3mm X 7" X 24" Laser Cut POPLAR PLY
1	.LC-501-03	.3mm X 5" X 24" Laser Cut POPLAR PLY
1	.LC-501-04	.3mm X 7" X 24" Laser Cut POPLAR PLY
1	.LC-501-05	.3mm X 7" X 24" Laser Cut POPLAR PLY
1	.LC-501-06	.1/8" X 4" X 24" Laser Cut BALSA
1	.LC-501-07	.1/8" X 4" X 24" Laser Cut BALSA
1	.LC-501-08	.1/8" X 4" X 24" Laser Cut BALSA
1	.LC-501-09	.1/8" X 4" X 24" Laser Cut BALSA
1	.LC-501-10	.3/32" X 4" X 24" Laser Cut BALSA
1	.LC-501-11	.3/32" X 4" X 24" Laser Cut BALSA
2	.LC-501-12	.3/32" X 4" X 24" Laser Cut BALSA
2	.LC-501-13	.3/32" X 4" X 24" Laser Cut BALSA
2	.LC-501-14	.3/32" X 4" X 24" Laser Cut BALSA
1	.LC-501-15	.3/32" X 4" X 24" Laser Cut BALSA
1	.LC-501-16	.3/32" X 4" X 24" Laser Cut BALSA
1	.LC-501-17	.3mm X 4" X 12" Laser Cut POPLAR PLY
1	.LC-501-18	.1/16" X 3" X 12" Laser Cut Birch Ply
1	.LC-501-19	.1/16" X 3" X 12" Laser Cut Birch Ply
3	.Fuselage Sheet	.1/8" x 4" x 24" Balsa
6	.Tail Sheet	.1/16" x 4" x 24" Balsa
5	.Wing & Center Section Sheet	.3/32" X 4" X 24" Balsa
4	.Wing Leading Edge Sheet	.3/32" x 3" x 30" Balsa
4	.Wing Trailing Edge Sheet	.3/32" x 1 1/2" x 18" Balsa
4	.Wing Trailing Edge Sheet	.3/32" x 1" x 18" Balsa
1	.K-501 PLAN A	
1	.K-501 PLAN B	
5	.Fuselage Stringers	.1/8" sq. X 12" Balsa
1	.Nose Block	.1/2" x 3" x 4" Balsa
4	.Outboard Main Wing Spars	.1/4" x 3/8" x 30" Balsa
1	.Tip Float Front Block	.3/4" x 1" x 5" Balsa
1	.Tip Float Rear Block	.1/2" x 3/4" x 5" Balsa
2	.Wing Leading Edge	.3/8" x 3/8" x 30" Balsa
2	.Center Section Main Wing Spars	.1/4" x 3/8" x 5" Spruce

Hardware Bag

Qty.	Name	Description
4	.Motor Mount Blind Nuts	.6-32 Blind Nuts
1	.Elevator Joiner Dowel	.1/4" x 4 1/2" Birch Dowel
2	.Wing Dowels	.1/4" x 1" Birch Dowel
2	.Wing Bolts	1/4-20 x 1" Nylon Screw
4	.Control Horn	Aileron and Tail Control Horns
15	.Aileron Servo, Cowl & Aileron Horn Screws	# 2 X 1/2" Sheet Metal Screw
4	.Tail Control Horn Screws	.2-56 x 1/2" Machine Screw
40"	.Wing Joint Tape	.1" x 40" Dacron Tape

Kit Contents:

Misc. Loose Parts

Qty.	Name	Description
1	.K-501 Plastic Cowl Set	1 left and 1 right
1	.K-501 Plastic Nacelle Set	1 left and 1 right

Additional Items Required (Not Included in Kit)

Qty. .Name .Description

- 1 .Motor .Himax HC3528-0800 Brushless Motor (Alien Aircraft P/N: AE-040)
- 1 .Speed Control .Castle Creation Phoenix ICE 50 Electronic Speed Control (Alien Aircraft P/N: AE-041)
- 1 .Battery Connector .Male Deans Ultra Style connector (Alien Aircraft P/N: AE-027)

- 1 .Arming Switch .Arming Switch with 12 awg & Dean's Ultra Style Connectors (Alien Aircraft P/N: AE-048)
- 1 .Motor Wire Extension .10" 3 wire extension #12 wire...3.5mm connectors (Alien Aircraft P/N: AH-045)

- 1 .Battery .4 Cell 5000Mah Lipo Battery 30C
- 1 .Battery Extension .7" Battery Extension Deans Ultra Style connectors (Alien Aircraft P/N: AE-046)

- 1 .Heat Shrink Tube .3/16" Heat Shrink Tube (Alien Aircraft P/N: AE-029)
- 2 .Tail Pushrods .Dubro 30" Laser Rods (1 pair) (Alien Aircraft P/N: AH-013)
- 2 .Aileron Pushrods .12" Aileron 2-56 Pushrods (1 pair) (Alien Aircraft P/N: AH-014)
- 1 .Propeller .APC 11 x 7E Propeller (Alien Aircraft P/N: AE-042)
- 2 .Velcro .6" Velcro (Alien Aircraft P/N: AE-012)
- 1 .Motor Mount Hardware .3528-0800 Motor Mount Screws (Alien Aircraft P/N: AE-043)

- 1 .Covering Material .2 Rolls Covering Material Plus Trim Colors
- 15 .Hinges .C/A or Pin Style Hinges

- 1 .Radio .4 Channel Radio with Receiver
- 2 .Tail Servos .HiTec HS-311 Standard Servos or Equivalent
- 2 .Aileron Servos .HiTec HS-81 Micro Servos or Equivalent
- 2 .Aileron Servo Extensions .12" Servo Extensions to fit your radio
- 1 .Aileron "Y" Connector .6" "Y" Connector to fit your radio
- 1 .Aileron Servo Extension .6" Servo Extensions to fit your radio

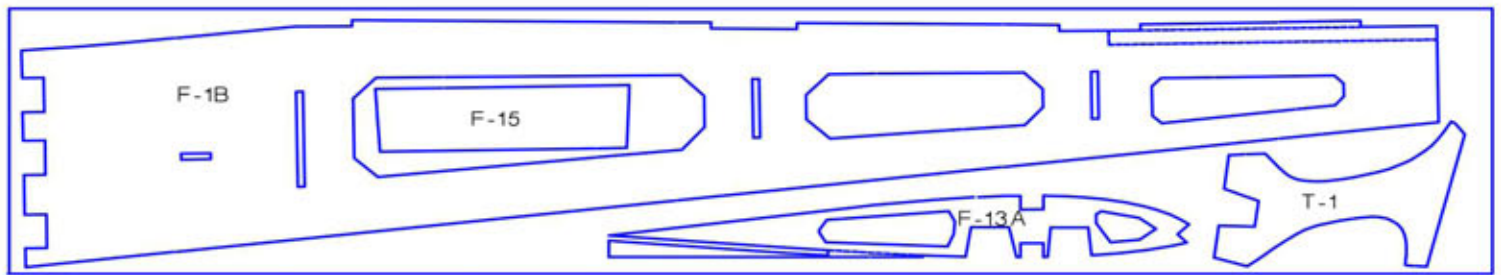
WARNING.....EXTREME DANGER:

Electric motors, propellers and batteries powerful enough to fly this model are extremely dangerous. These motors, propellers and batteries can cause serious property damage, serious bodily injury and death. Maximum safety precautions must be observed at all times when installing, maintaining and operating these items. Maximum safety precautions must be observed at all times when assembling, maintaining and operating this model. You must understand and follow all of the manufactures operating and safety instructions for every piece of equipment and component used with this model.

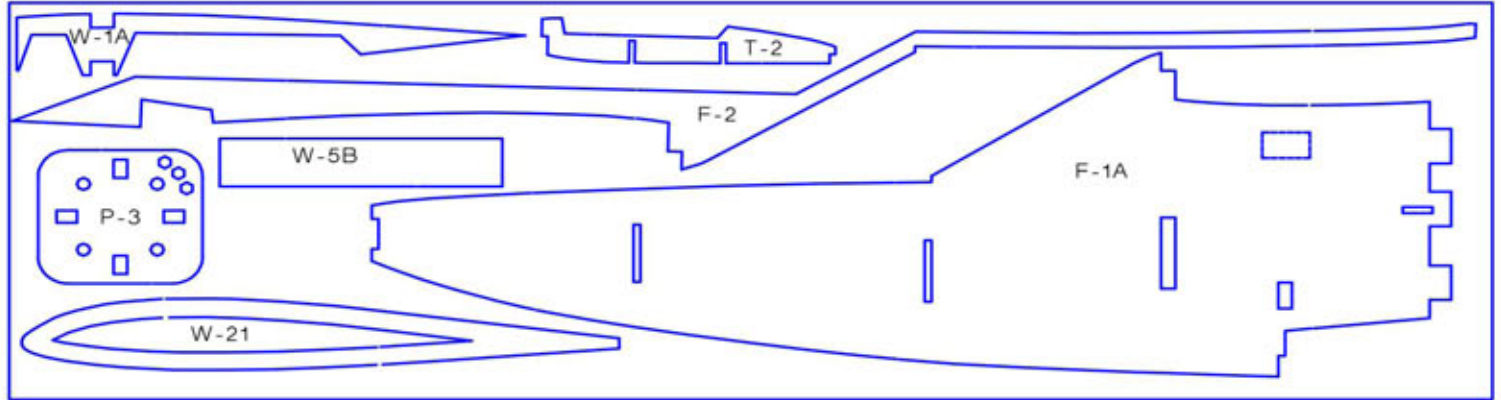
YOU MUST USE AN ARMING SWITCH BETWEEN THE BATTERY AND SPEED CONTROLLER.

If you have any doubt about the proper safety precautions, you must contact the manufactures to obtain the operating and safety instructions for every piece of equipment and component used with this model.

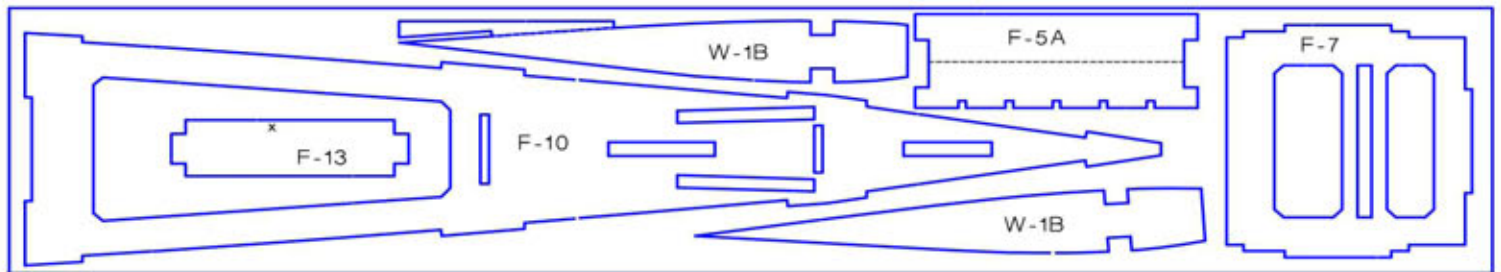
You must read and follow the important notes on the cover and on page 41 of this manual.



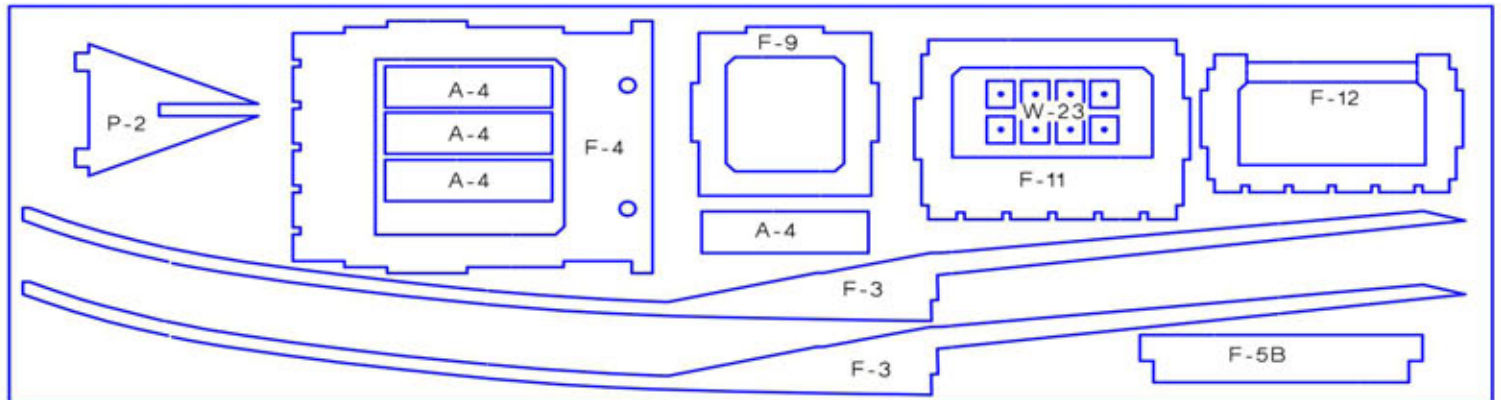
LC-501-01 3mm X 5" X 24" Poplar Ply 2 REQD.



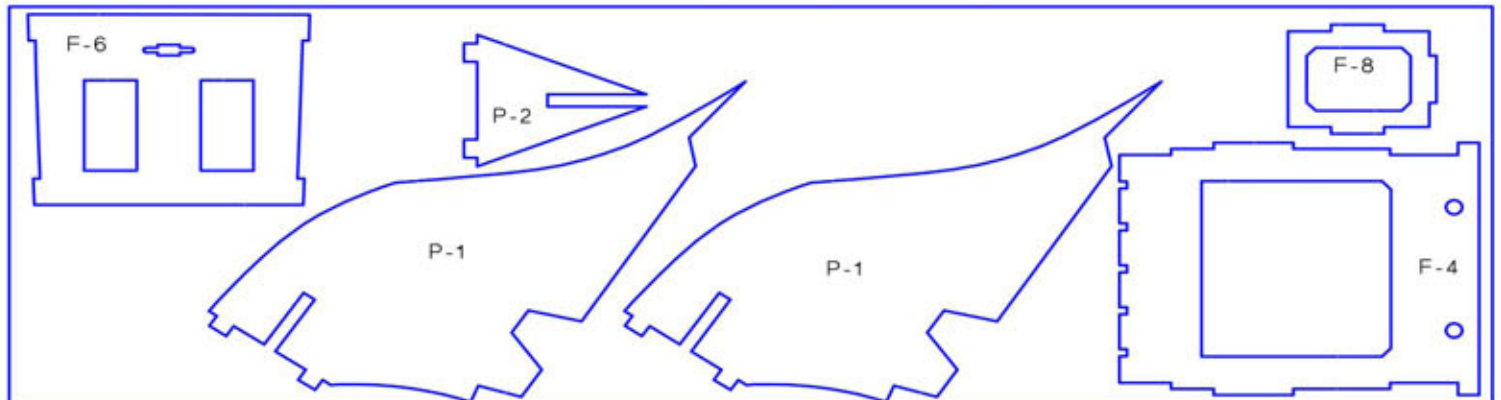
LC-501-02 3mm X 7" X 24" Poplar Ply 2 REQD.



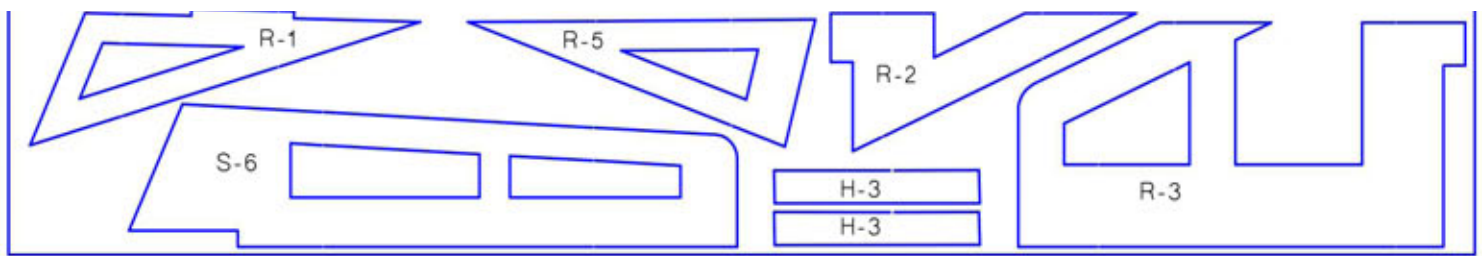
LC-501-03 3mm X 5" X 24" Poplar Ply 1 REQD.



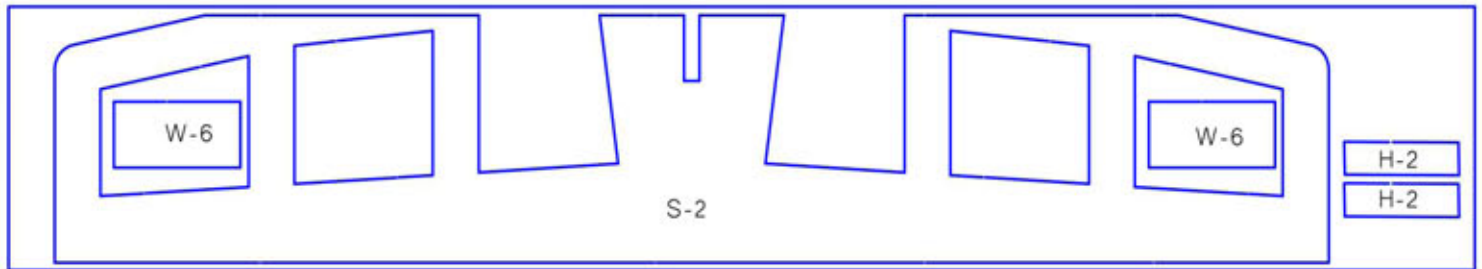
LC-501-04 3mm X 7" X 24" Poplar Ply 1 REQD.



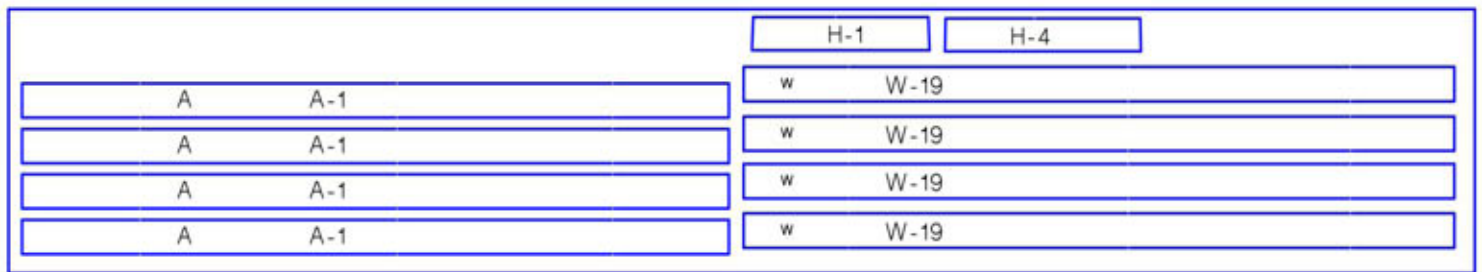
LC-501-05 3mm X 7" X 24" Poplar Ply 1 REQD.



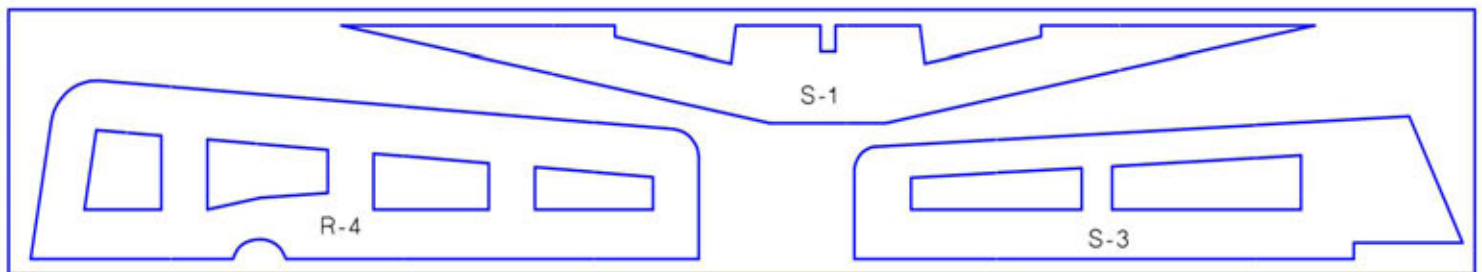
LC-501-06 1/8" X 4" X 24" BALSA 1 REQD.



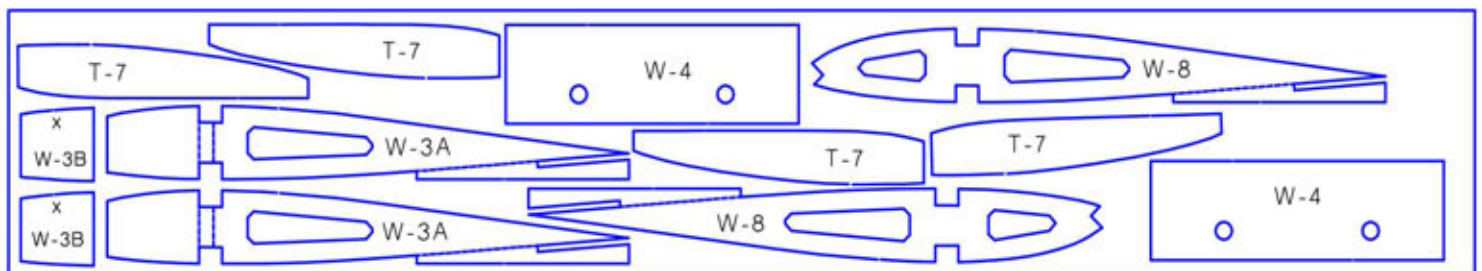
LC-501-07 1/18" X 4" X 24" BALSA 1 REQD.



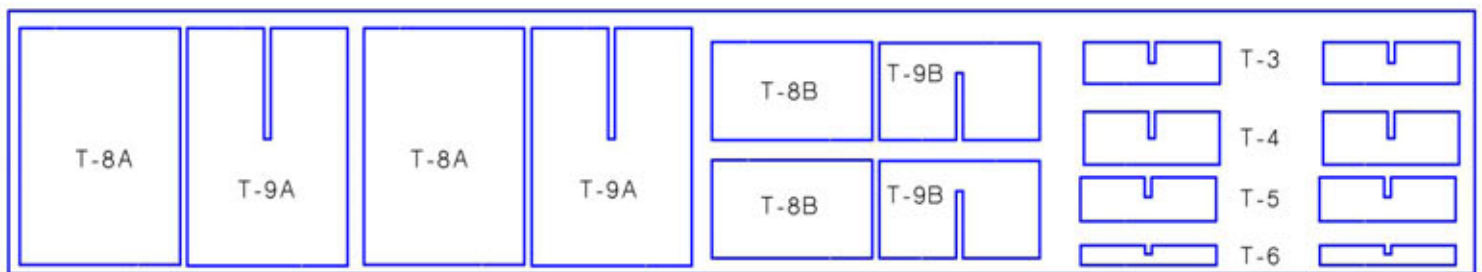
LC-501-08 1/8" X 4" X 24" BALSA 1 REQD.



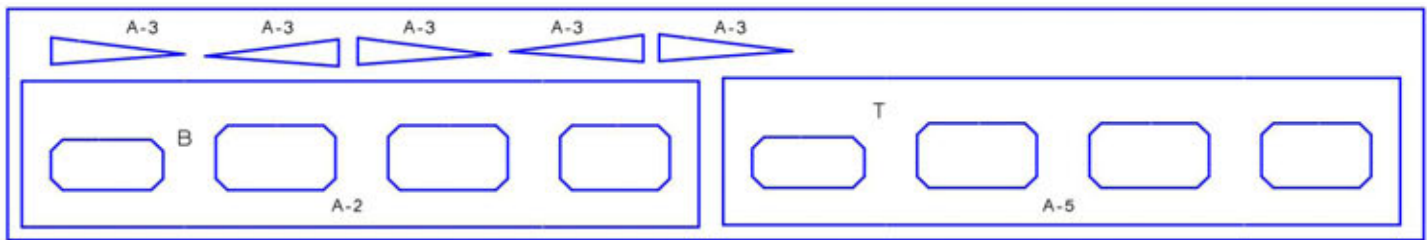
LC-501-09 1/8" X 4" X 24" BALSA 1 REQD.



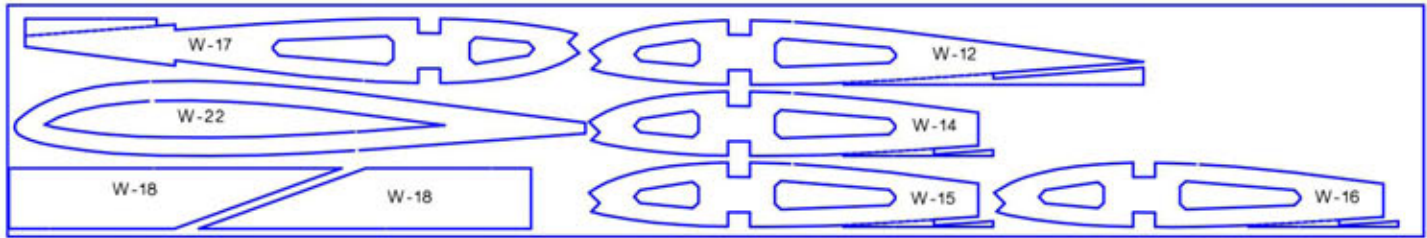
LC-501-10 3/32" X 4" X 24" BALSA 1 REQD.



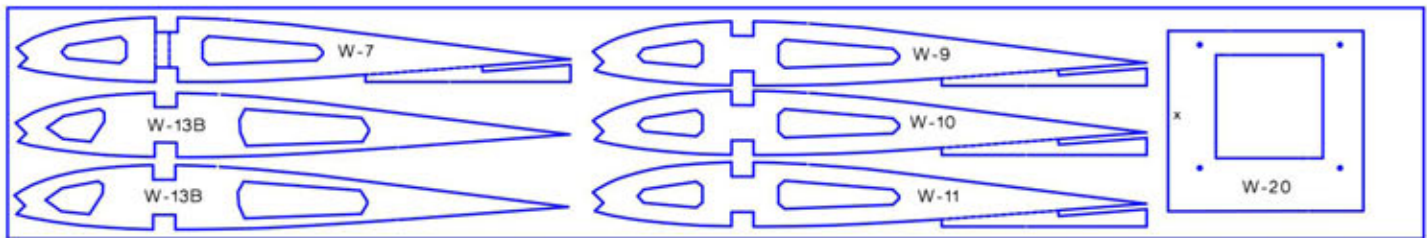
LC-501-11 3/32" X 4" X 24" BALSA 1 REQD.



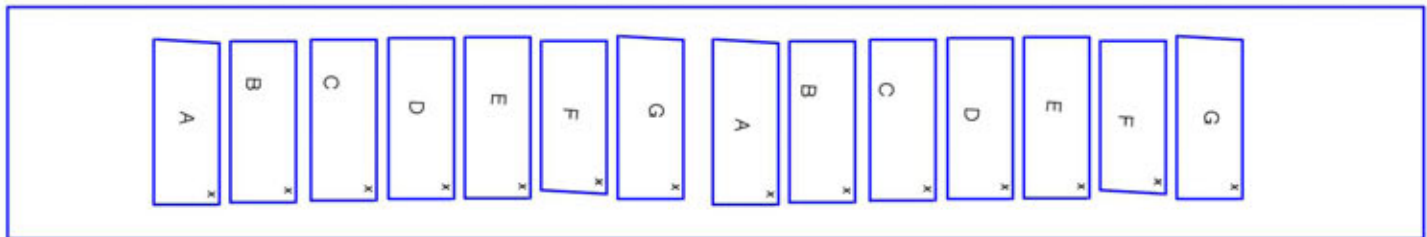
LC-501-12 3/32" X 4" X 24" BALSA 2 REQD.



LC-501-13 3/32" X 4" X 24" BALSA 2 REQD.



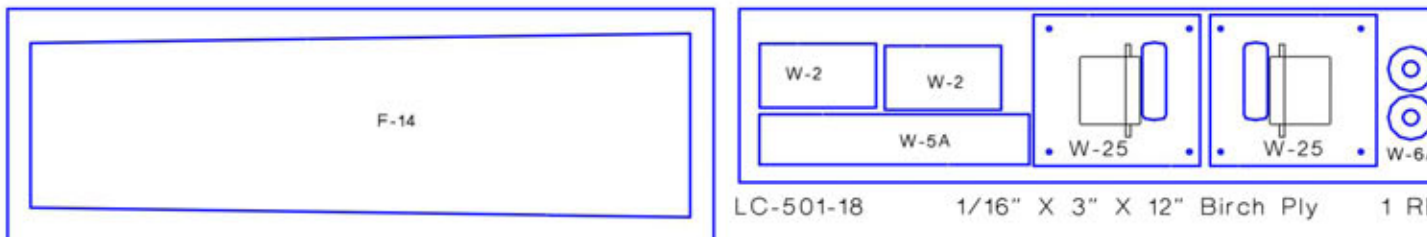
LC-501-14 3/32" X 4" X 24" BALSA 2 REQD.



LC-501-15 3/32" X 4" X 24" BALSA 1 REQD.



LC-501-16 3/32" X 4" X 24" BALSA 1 REQD.



LC-501-18 1/16" X 3" X 12" Birch Ply 1 REQD.

LC-501-17 3mm X 4" X 12" Poplar Ply 1 REQD.



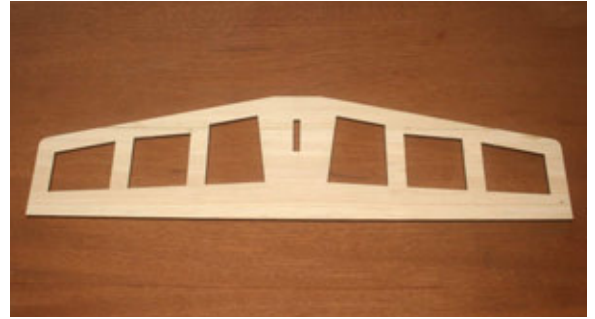
LC-501-19 1/16" X 3" X 12" Birch Ply 1 REQD.

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 S-1 and S-2 together as shown.



2...Glue together two pieces of 1/16" x 4" x 24" balsa sheet as shown to make the stabilizer skin.



3...Glue this sheet to one side of the stabilizer.



4...Trim the sheet flush with S-1 / S-2. Now sheet and trim the opposite side as you did the first. Be sure to cut out the rudder slot.



5...Use 1/16" balsa to sheet both sides of the elevators (S-3).



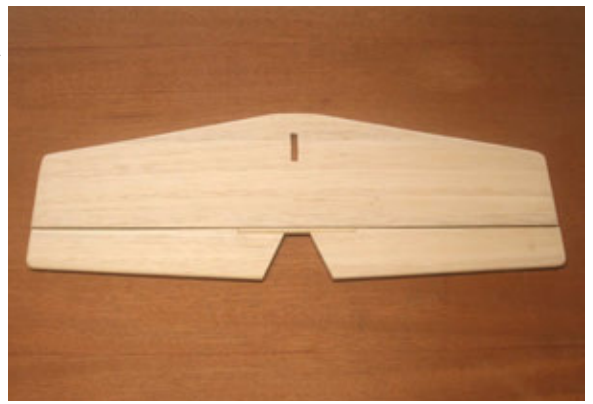
6...Join the elevators (S-3) using the 1/4" x 4-1/2" dowel. Use the stabilizer as a guide. Trim the dowel if required to achieve the proper length.



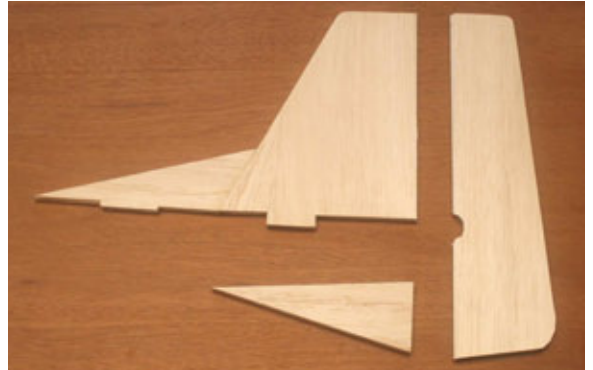
7...Bevel the front edge of the S-3's as shown on the plan, and sand the other edges round.

Sand the front and ends of the stabilizer round. Leave the back edge square.

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



8...Glue R-2 and R-3 together. Use 1/16" balsa to sheet both sides of R-1, R-2/3, R-4 and R-5. Glue R-1 to the front of R-2/R-3.



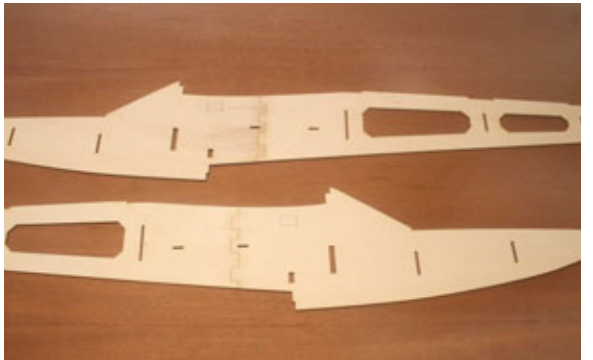
9...Bevel the front edge of R-4 as shown on the plan, and sand the other edges round.

Mark the hinge locations and cut the hinge slots in R-3, R-4 and R-5. Temporarily install the hinges without glue. Sand the outside edges round. Leave the other edges square.



Building the Fuselage:

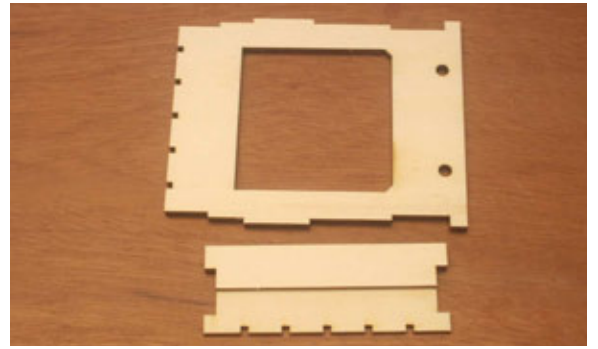
10...Assemble the fuselage sides using parts F-1A and F-1B.



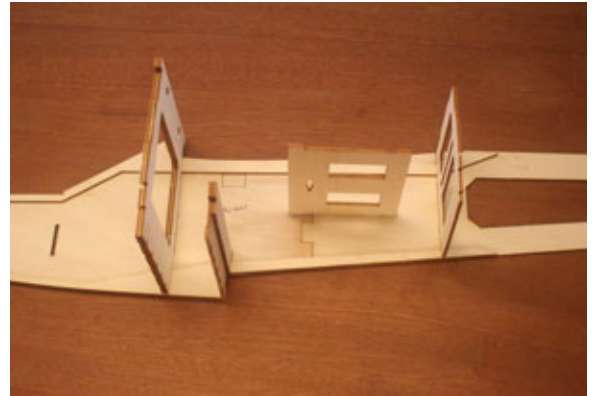
11...Glue the F-2 and F-3 doublers to the inside of the fuselage sides. **Be sure to make a right hand and a left hand side.** Use the drawing on the plan to properly locate the doublers on the fuselage sides.



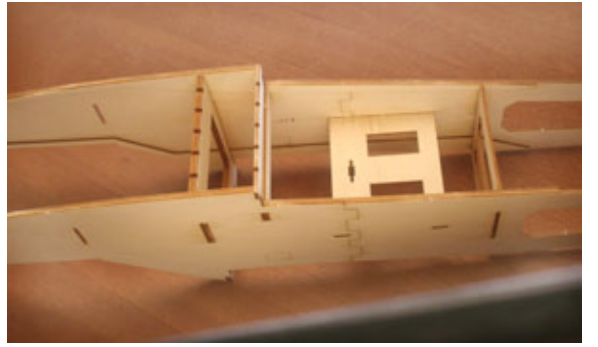
12...Glue the two F-4's together and glue F-5B to F-5A.



13...Lightly tack glue formers F-4 , F-5 , servo tray F-6 and F-7 into position on the right fuselage side. F-5B is on the back side of F-5.



14...Place the left fuselage side into position and square up the fuselage. Glue the left and right fuselage sides tightly against F-6. Make sure that the fuselage is square and completely glue the formers to the fuselage sides.



15...Place former F-8 into position and pull the rear of the fuselage sides together. Adjust the back end until the fuselage is straight and square. Glue the fuselage sides together and glue the former in place.



16...Place former F-9 into position and glue in place.



17...Glue F-10 into position on the top rear of the fuselage. Spread and squeeze the sides as required to get F-10 to fit in the proper position.



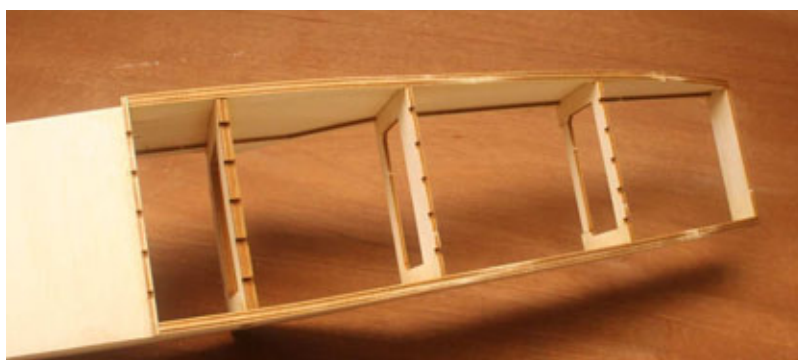
18...Use the 1/8" x 4" x 24" balsa to sheet the bottom rear of the fuselage. This should be done in pieces with the grain going across the fuselage from left to right.



19...When the glue is dry, trim the sheet flush with the fuselage sides.



20...Glue formers F-11, F-12 and F-13 into place in the front of the fuselage. There is a small "x" marked on F-13. This is the top side. Use care to keep the fuselage straight and square.



21...Glue velcro to the top side of the F-14 battery tray. Make a velcro strap and glue it to the bottom of the battery tray.



22...Glue the battery tray into position on the formers as shown. Use the plan as a guide to establish the proper fore and aft placement.



23...Glue The 1/8" x 12" balsa strips into place in the notches in the bottom of the fuselage formers. The front ends should stop at former F-12. The back ends should be cut flush with the back of F-5.



24...Use the 1/8" x 4" x 24" balsa to sheet the bottom front of the fuselage. This should be done in pieces with the grain going across the fuselage from left to right. When the glue is dry, trim the sheet flush with the fuselage sides.



25...Trim the top of former F-12 away at the dashed lines.



26...Use the 1/8" x 4" x 24" balsa to sheet the top front of the fuselage. This should be done in pieces with the grain going across the fuselage from left to right. When the glue is dry, trim the sheet flush with the fuselage sides. Do not sheet the windshield area at this time.

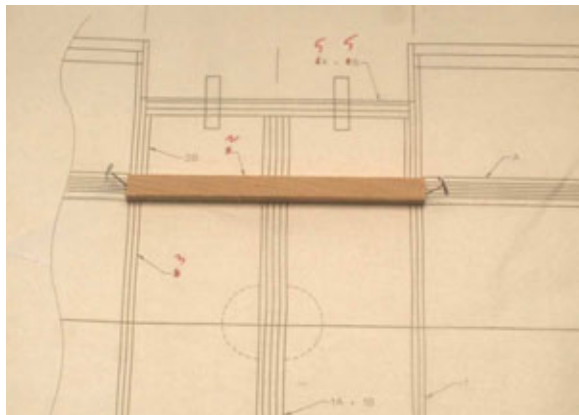


27...Glue the two F-15's into place on the top of the fuselage in the notches in the F-2 doublers just in front of former F-7.



Building the Wing Center Section:

28...Pin the lower 1/4" x 3/8" x 5" spruce lower main spar to the plan. The ends will extend slightly past the W-3 ribs.



29...Glue the two W-1A together



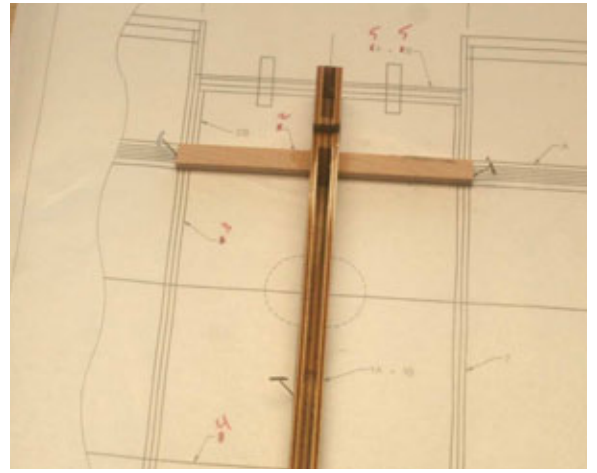
30...Glue the W-1B ribs to each side of the W-1A's. Only one of the W-1B's has the support tab on the bottom rear. It doesn't matter if you put it on the left or right side.



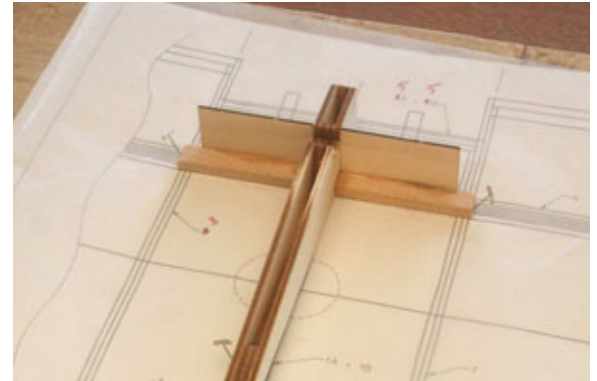
31...Glue the W-3B doublers to the front of the W-3A ribs. Be sure to make a left and right as shown.



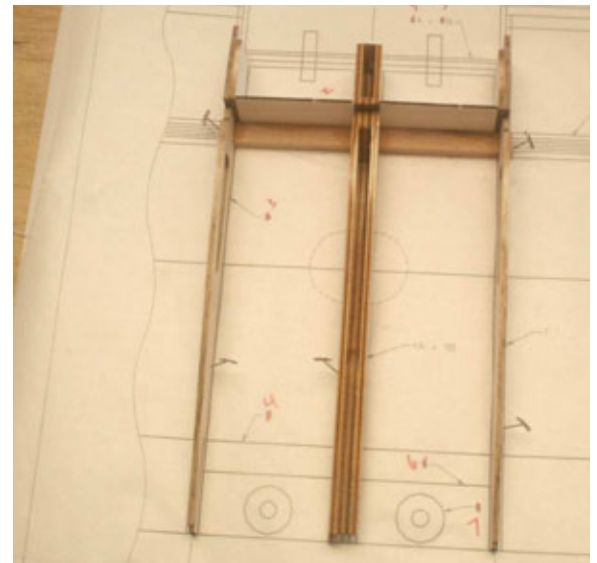
32...Glue the W-1 rib into position on the lower main spar. The rib should be 90 degrees to the building board.



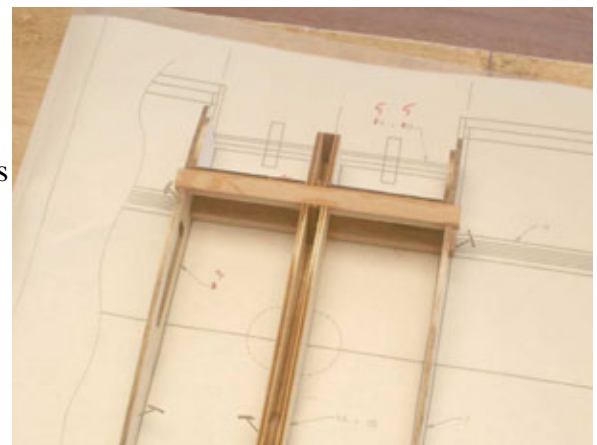
33...Glue the W-2 shear webs into position on the front of the spar on each side of the W-1 rib. They should be tight against the rib and aligned with the spar slot in the top of the rib.



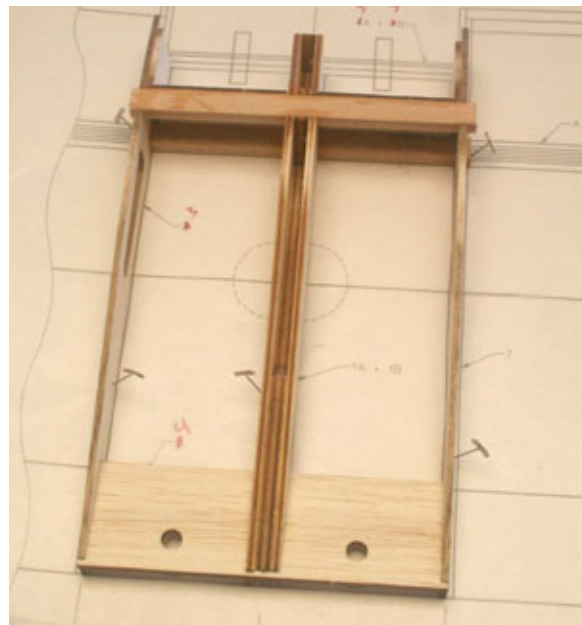
34...Place the W-3 ribs onto the lower spar. They should be tight against the W-2 shear webs. The W-3B's should be on the inboard sides. When in the proper position, glue the ribs to the spar.



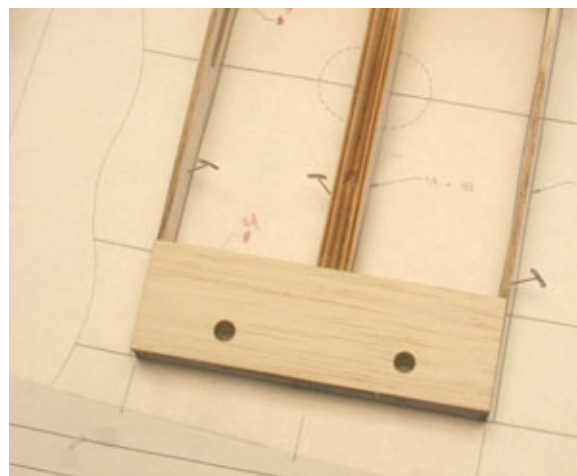
35...Put the 1/4" x 3/8" x 5" spruce top main spar into place. The ends will extend slightly past the W-3 ribs. Glue it to the ribs and shear webs.



36...Slide one W-4 into the slots on the bottom of the ribs as shown. Center it and make sure it is fully forward in the slots and glue to the ribs.



37...Glue the other W-4 into position on top of the ribs.



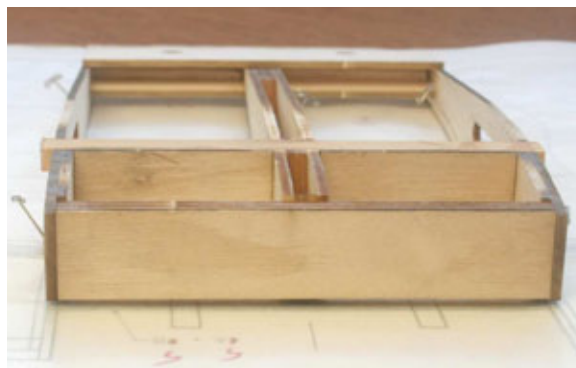
38...Use sandpaper to taper the two W-6's so they fit into the gap between the two W-4's. They should fit tight and be positioned as far back as possible. Glue the W-6's in place.



39...Glue the two W-5B's and W-5A together as shown.



40...Place the W-5 assembly into place between the W-3 ribs. It should be aligned up and down with the front corners of the W-3 ribs, and back against the W-3B doublers and the W-1 ribs. When in the proper position, glue in place.



41...Use the 3/32" x 4" x 24" balsa to sheet the top of the wing center section. The grain should run left to right. Leave the edges slightly long on the sides and front.



Cut the sheet away from the motor pylon slot in the W-1A ribs.

42...Remove the center section from the plan. Cut the support tabs from the bottom of the ribs. Use the 3/32" x 4" x 24" balsa to sheet the bottom of the wing center section. The grain should run left to right.



43...When the glue is dry, trim the spars and sheet flush with the W-3 ribs and the front of W-5. Sand the top and bottom of the center section smooth.

44...Sand a bevel around the edges of the W-6A's. Glue them on the top of the center section, centered on the holes in W-4. Cut the top sheet away from the forward pylon slot in the W-1 rib.



45...Using a 1/4" drill bit, drill out the wing bolt holes in the W-6 pieces that are between the W-4's.



46...Test fit the wing center section onto the fuselage. Sand the back end if required to fit tightly down into the step in the fuselage. The front must be tight against and in full contact with F-4.



47...Center the center section left and right on the fuselage. Hold it tightly in position, and using a 3/16" drill bit, drill the bolt holes in parts F-15 in the fuselage. The drill bit must be centered in the 1/4" holes in the center section and be 90 degrees to the top surface of the center section so the bolt heads will sit flat.

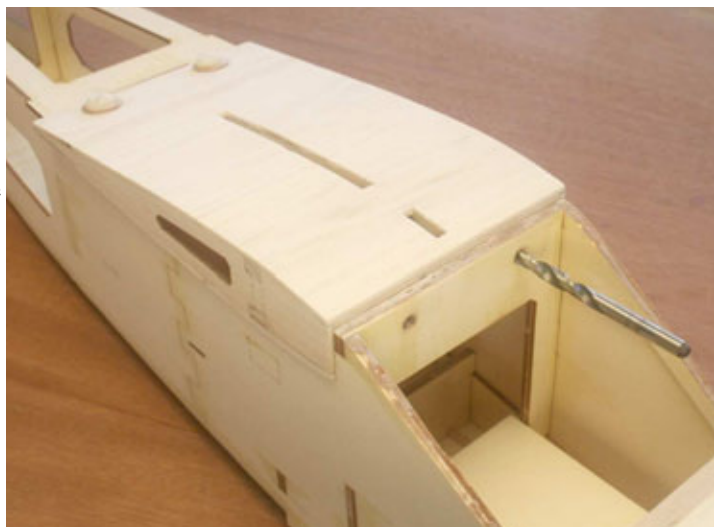


48...Use a 1/4-20 tap to cut threads in the holes drilled in F-15. Apply some thin C/A to harden these threads and when the glue is dry, re-tap to clean up the threads.

Use the two 1" nylon bolts to attach the center section to the fuselage.



49...**Hold the center section tightly against the fuselage.**
Use a 1/4" drill bit to drill holes through F-4 into W-5 for the wing dowels.



50...Remove the center section from the fuselage. Insert the 1/4" dowels into the holes in W-5. They should stick out 3/8". Securely glue the dowels into position. When the glue is dry, check the fit on the fuselage again.



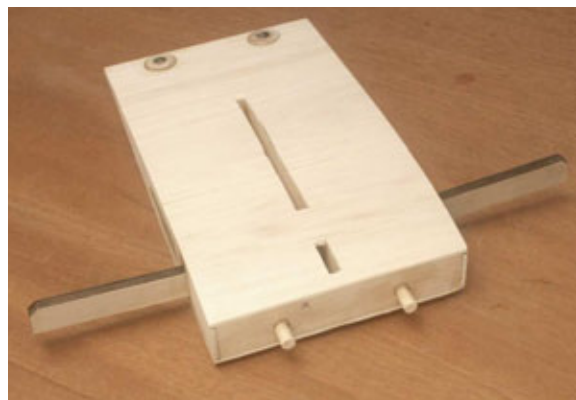
51...Remove the center section from the fuselage. Cut open the 1/4" wide slots in the W-3 ribs between the dashed lines for the wing joiners.



52...Glue four wing joiners together to make a single piece 1/4" thick. Test fit the joiner into the slot in the W-3 rib on one side. The outboard ends of the joiners should angle up. The top outboard corner of the joiners is cut off at a 45 degree angle. Securely glue the joiners to the top and bottom spars, shear web W-2 and the W-1 rib.



53...Assemble and glue the opposite side wing joiner into position.



54...Cut openings in the bottom sheet for the aileron servo wires as shown here and on the plan.



55...Use the 1/8" x 4" x 24" balsa to sheet the windshield area of the fuselage. This should be done in pieces with the grain going across the fuselage from left to right. When the glue is dry, trim the sheet flush with the fuselage sides.



56...Cut the 1/2" x 3" x 4" balsa block in half to make two 1/2" x 1-1/2" x 4" pieces. Glue these pieces onto the front of F-13. Center them top to bottom and left to right.



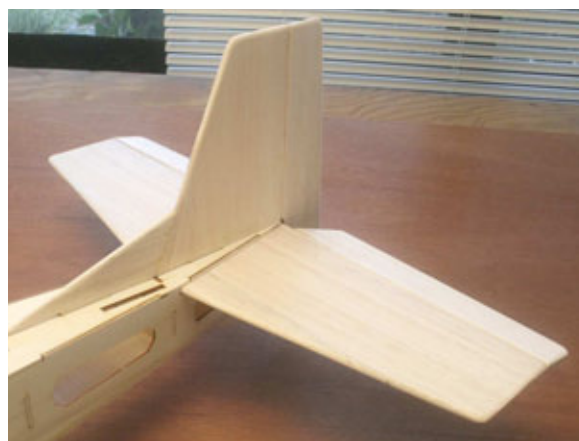
57...Sand these nose blocks to match the angles of the top and bottom of the fuselage. Now, sand the nose block round and then sand the ends flush with the fuselage sides.



58...Cut on the dashed lines to remove the wood from the stabilizer slots on the fuselage sides.



59...Test fit the tail surfaces on the fuselage. Sand or trim if required to obtain the proper fit.

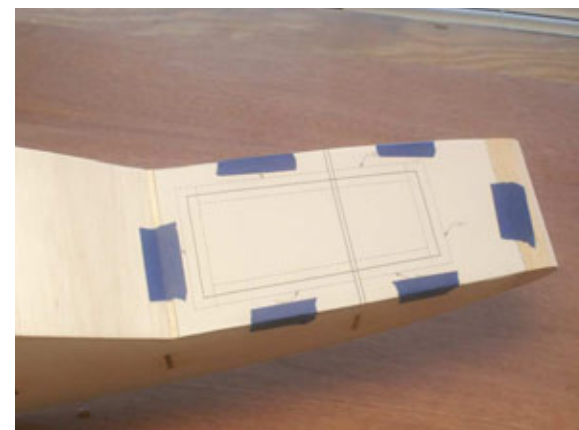


60...Cut out the mounting hole for the arming switch in one side of the fuselage. We put it in the left side but either side is OK, but only make the cut out in one side.

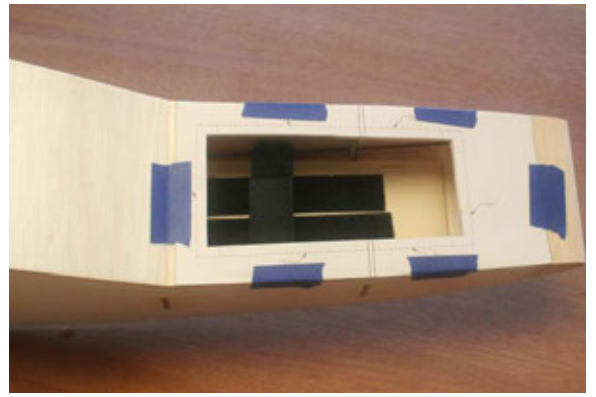
NOTE: If you are using electric power, you MUST USE AN ARMING SWITCH.



61...Cut the battery hatch template from the plan and tape it to the top of the fuselage as shown.

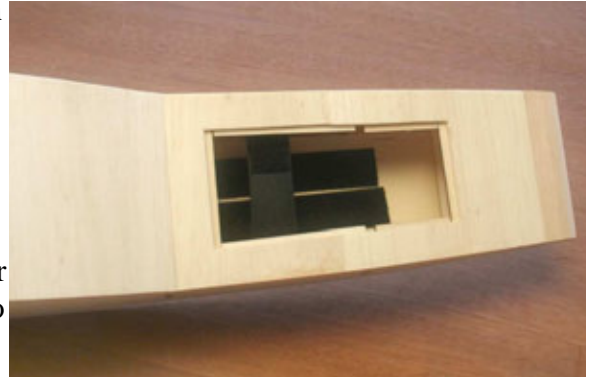


62...Following the lines on the template, cut the hatch from the fuselage.



63...Glue parts H-1 thru H-4 into position on the underside of the hatch opening making a ledge for the hatch to sit on.

Place the hatch back in place. Trim or sand the edges of the hatch so there is a slight gap around the edged to allow for the thickness of the covering material.



64...Sand the fuselage and tail surfaces smooth all over. Bolt the center section back onto the fuselage and sand the front end and windshield to match.

Building the Right Wing:

65...Cover the right wing plan with wax paper to prevent the parts from sticking to the plan.

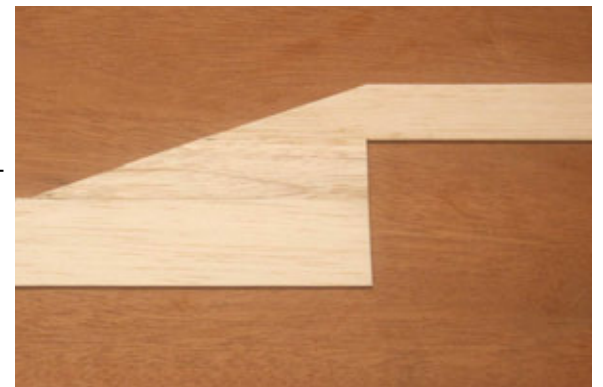
66...Make one trailing edge by placing W-18 against one of the 3/32" x 1-1/2" x 18" balsa sheets. The end of W-18 should be flush with the end of the 1-1/2" balsa. When properly positioned, glue the two pieces together.

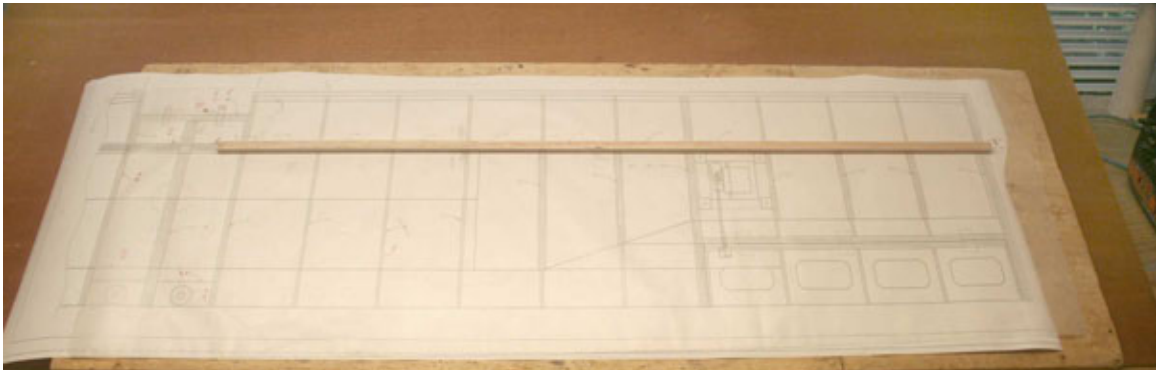


67...Place one of the 3/32" x 1" x 18" balsa sheets against W-18. The end of the 1" balsa should be positioned as shown. When properly positioned, glue the two pieces together.



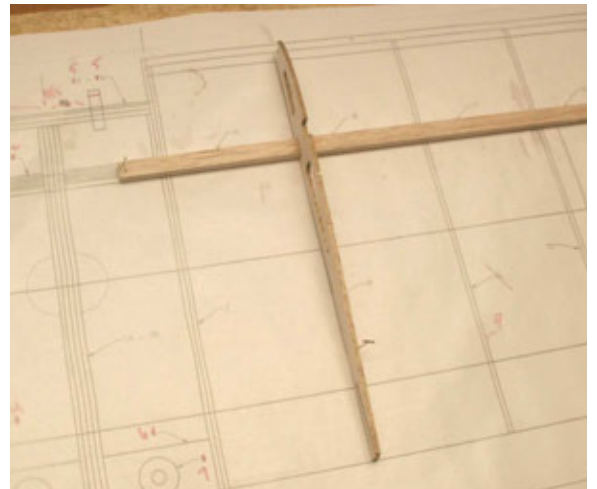
68...Trim the end of the 3/32" x 1" balsa sheet to match the angle on W-18 as shown. Now repeat the previous steps to make a second trailing edge.





69...Pin the lower 1/4" x 3/8" x 30" lower main spar to the plan. Let the ends extend past the W-7 ribs and the wing tip

70...Pin and glue rib W-8 into position on the bottom spar. It should be 90 degrees to the building board.

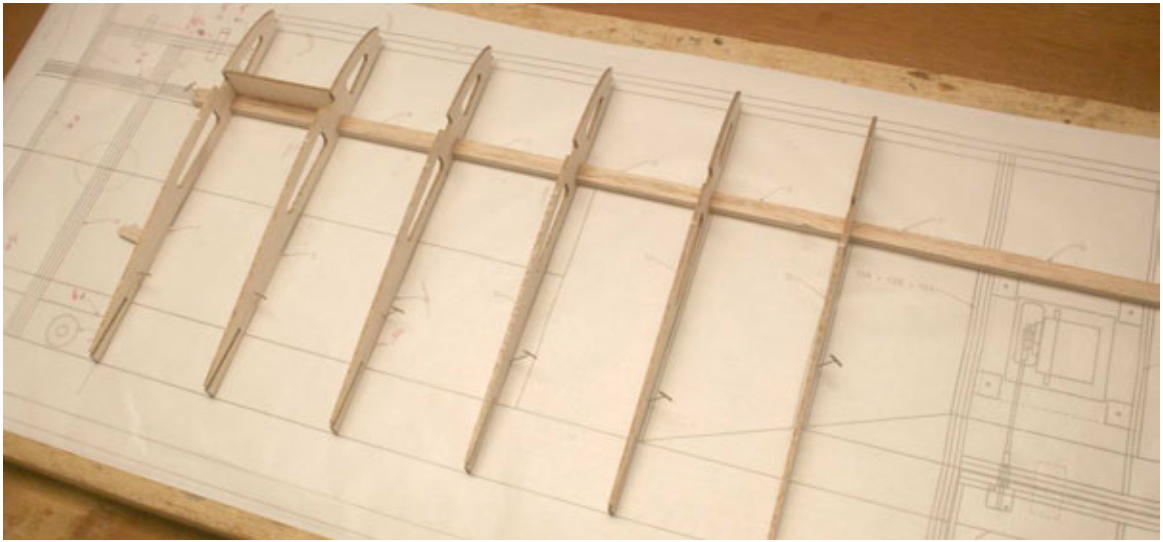


71...Glue shear web "A" into position against the front face of the lower spar and rib W-8 as shown on the plan. The small "X" on the shear web marks the top outboard corners of the shear webs.



72...Pin and glue rib W-7 into position. The top of the rib should angle slightly toward the wing tip and be in full contact with the shear web.



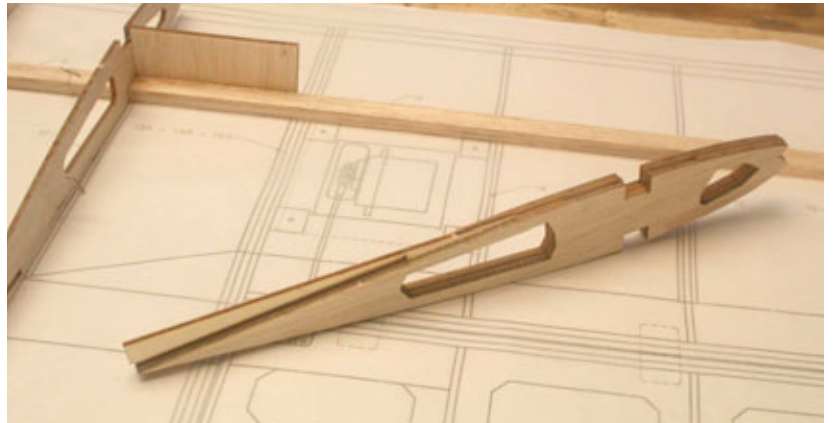


73...Pin and glue ribs W-9, W-10, W-11 and W-12 into position. They should be 90 degrees to the building board.

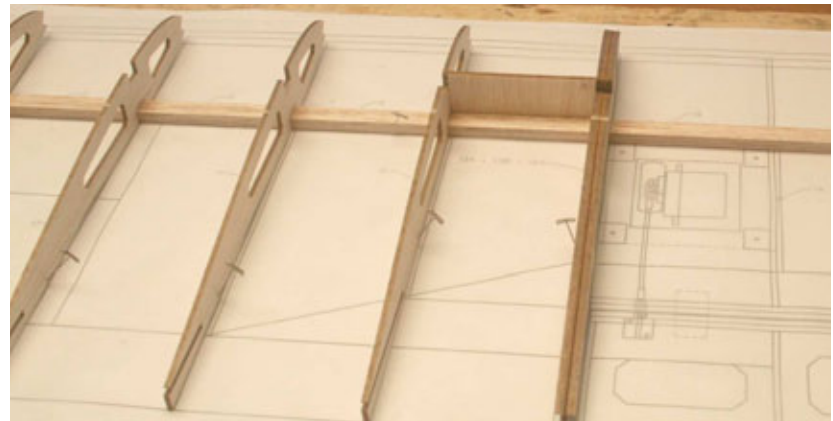
74...Glue shear web "F" into position against the front face of the lower spar and outboard of rib W-12 as shown on the plan. The small "X" on the shear web marks the top outboard corners of the shear webs.

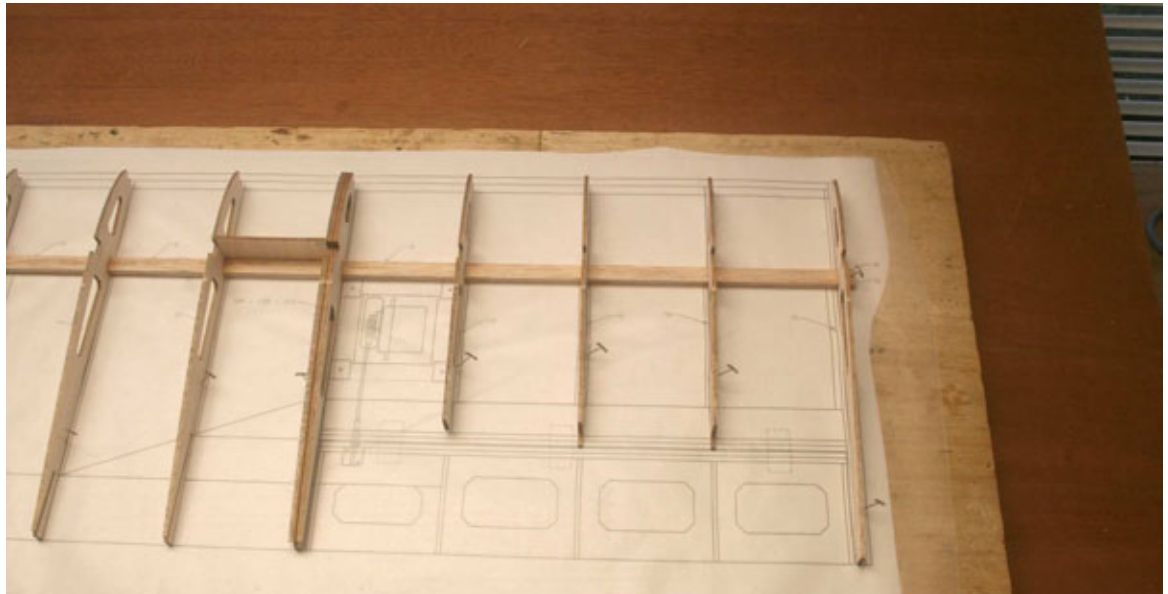


75...Glue a W-13B to each side of W-13A.



76...Pin and glue rib W-13 into position. The top of the rib should angle slightly toward the wing tip and be in full contact with the shear web.





77...Pin and glue ribs W-14, W-15, W-16 and W-17 into position. They should be 90 degrees to the building board.

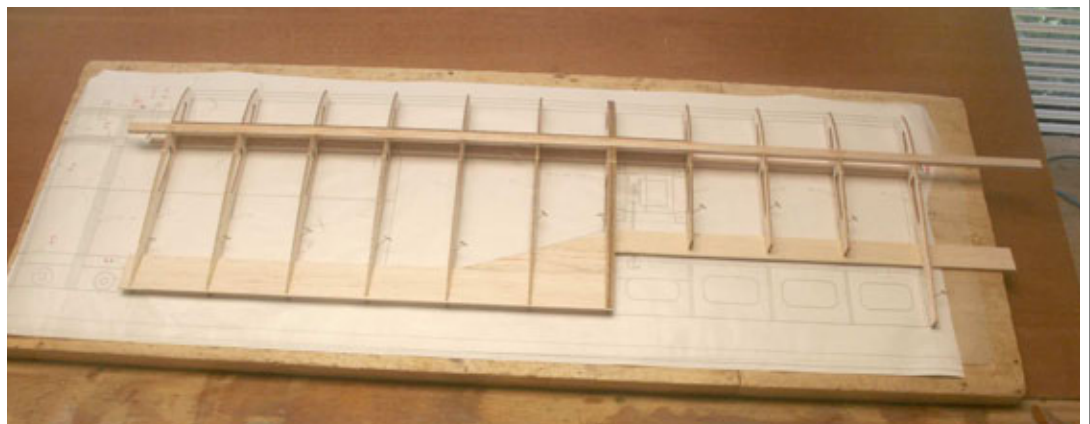


78...Glue the 1/4" x 3/8" x 30" top spar into position.



79...Glue the remaining shear webs B, C, D, E and G into position. Trim the ends to get the proper fit if needed.

80...Working from the tip to the center, slide the trailing edge under W-17 and then into the slots in the remaining ribs. Line up the aileron cutout with the outboard edge of W-13. Make sure that the trailing edge is fully forward in the slots and glue in place.



81...Glue two W-19's together. Put into position and glue to the ribs and bottom trailing edge sheet between ribs W-13 and W-17.



82...Place the top trailing edge sheet into position and glue into place. Glue the 3/8" sq. leading edge into position on the front of the ribs.



83...Position the 3/32" x 3" x 30" leading edge sheet against the leading edge as shown. When positioned properly, glue the sheet to the leading edge only.



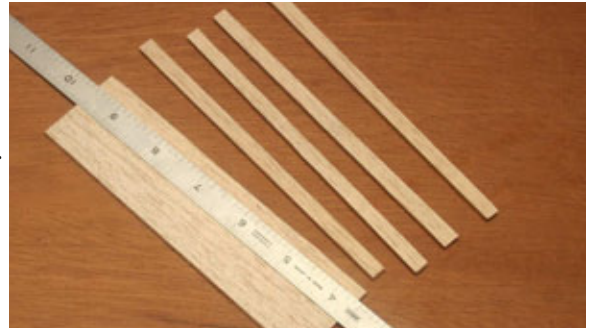
84...Moisten the outside of the leading edge sheet with an ammonia based glass cleaner such as Windex. Allow it to soak in for several minutes. Roll the sheet back and glue thoroughly to the ribs and main spar.



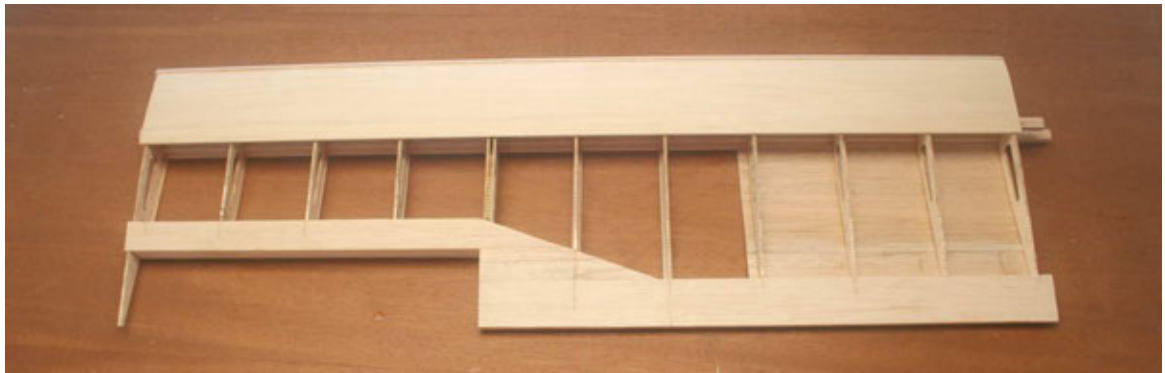
85...Cut two pieces 9" long from one of the 3/32" x 4" x 24" balsa sheet. Save the 6" leftover piece for use in the next step. Use the 9" pieces to sheet the inboard end of the wing from W-7 to just slightly past W-10, and between the leading edge sheet and trailing edge.



86...Cut 1/4" x 6" strips from the left over sheet from the previous step.



87...Use these 1/4" wide strips as cap strips and glue into position on top of the W-11 thru W-17 ribs. The cap strips should be centered on the ribs except for W-17. The W-17 cap strip should be flush with the outboard face of the rib and extend inboard.



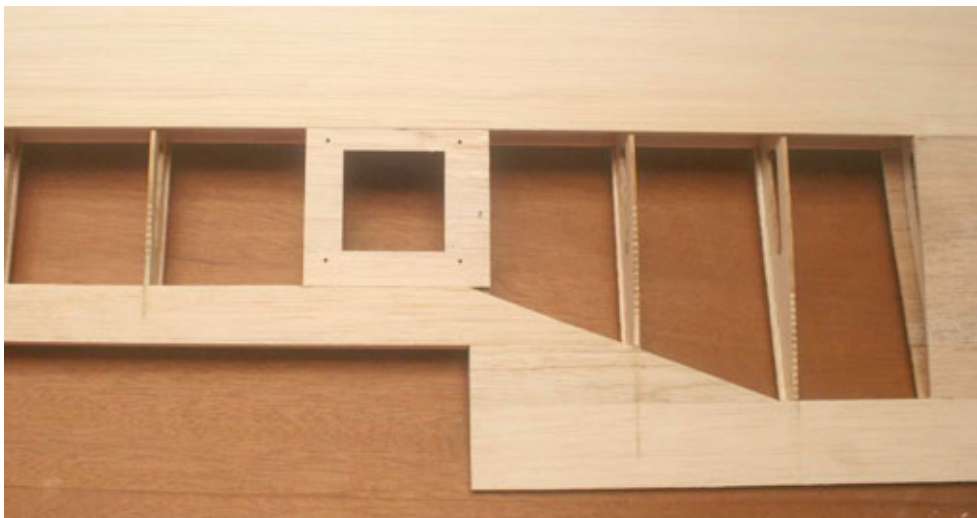
88...Remove the wing from the plan. Trim the supports from the trailing edge of the wing ribs.

89...Using 3/32" x 3" x 30" balsa, sheet the lower leading edge as you did the top.

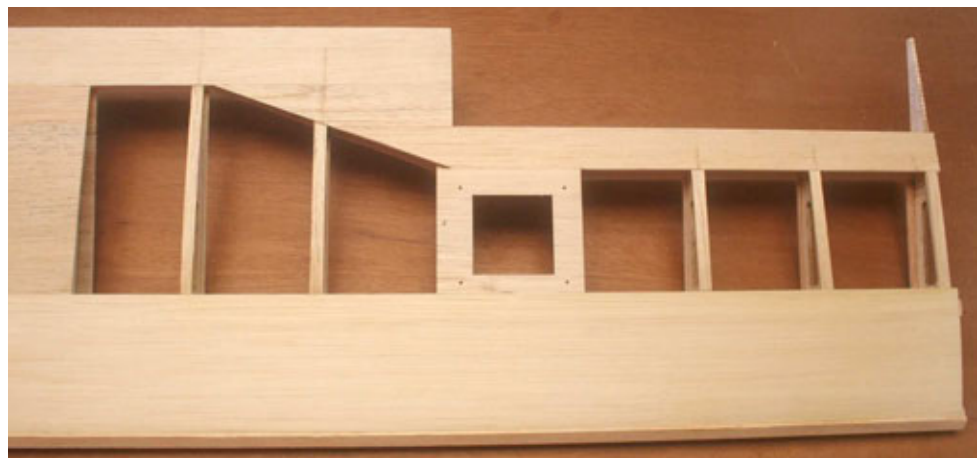
90...Sheet the inboard end of the wing as you did the top.



91...Test fit W-20 on top of ribs W-13 and W-14 as shown. The small "x" marked on W-20 is the inboard end. Trim the back edge to fit tight against the trailing edge. When the proper fit has been achieved, glue W-20 into place.

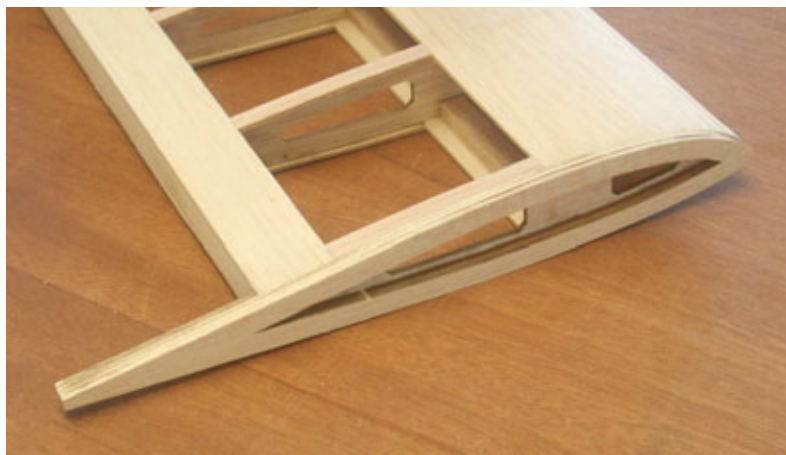


92...Fit and glue 1/4" wide cap strips to the remaining ribs as you did the opposite side.



93...Trim the excess spars and sheet flush with the ribs on both ends of the wing.

Glue W-21 to W-22, making the wing tip. Glue the wing tip to the W-17 rib as shown.



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



95...Cut the slots in the bottom of rib W-13 for the tip floats as shown.



96...Glue four W-23's to the inside of W-20. They should be positioned so the holes line up with the holes in W-20.



Repeat steps 65 thru 96 to build the left wing.

Building the ailerons:

Build the right aileron.

97...Glue two A-1's together. Trim an angle on the bottom edge of the A-1's



98...Glue the A-1 onto and flush with the front of A-2. Place it with the angle down so it leans toward the trailing edge.



99...Glue the first A-3 rib into position. It should be flush with the end and 90 degrees to A-2.



100...Position two A-4's into position against A-1 and A-3 and glue into place.



101...Glue the remaining A-3's into place.



102...Trim an angle on the top of the A-1's to match the angle on the top of the A-3's.



103...Glue A-5 onto the top of the aileron. Sand the ends, front, top and rear of the aileron flush.



104...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.

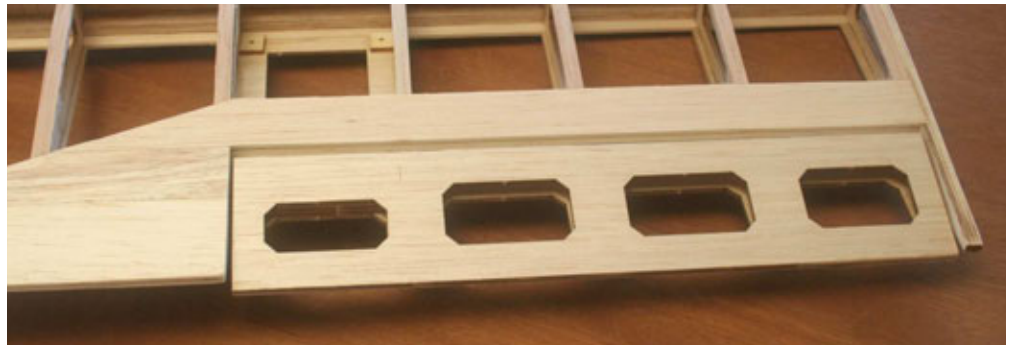


105...Use these lines as a guide to trim or sand the proper angles on the front of the aileron as shown on the plan.



106...Mark a line centered on the back of the aileron spar (W-19). Mark the hinge locations and cut slots for the hinges. Use some scrap 1/8" balsa to make the hinge fillers and glue them to the aileron and wing as shown on the plan.

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



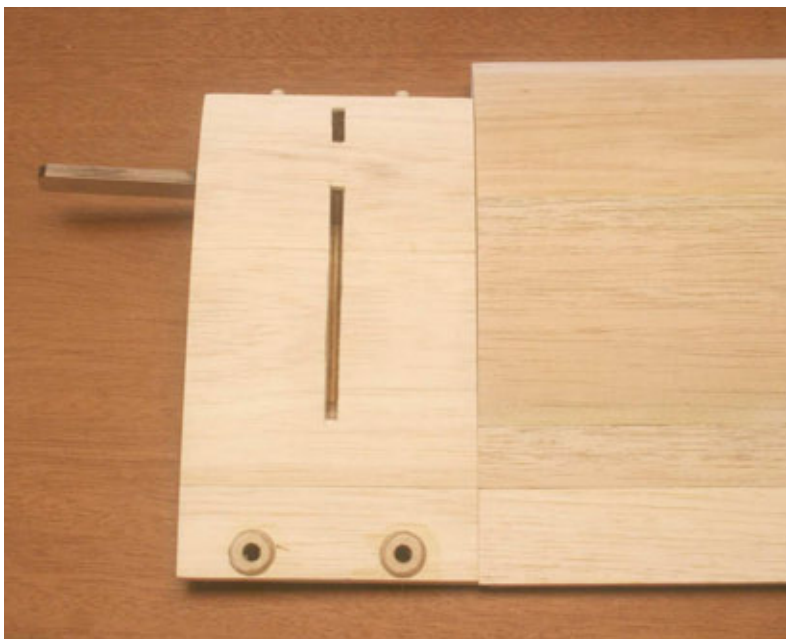
107...Repeat steps 97 thru 106 to build the left aileron.

Joining The Wing:

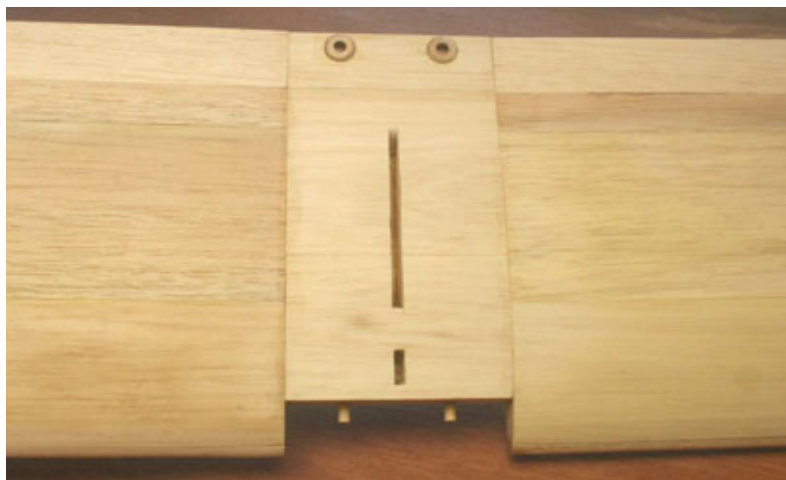
108...Cut slots in both W-7 ribs at the dashed lines to accept the wing joiner.



109...Slide the wing joiner on the center section into position in the right wing. Position it tightly between the spars and forward against the shear web and glue the right wing to the center section. Glue the joiner to the shear web and the top and bottom spars and glue the rib to the center section.



110...Slide the wing joiner on the center section into position in the left wing. Position it tightly between the spars and forward against the shear web and glue the left wing to the center section.

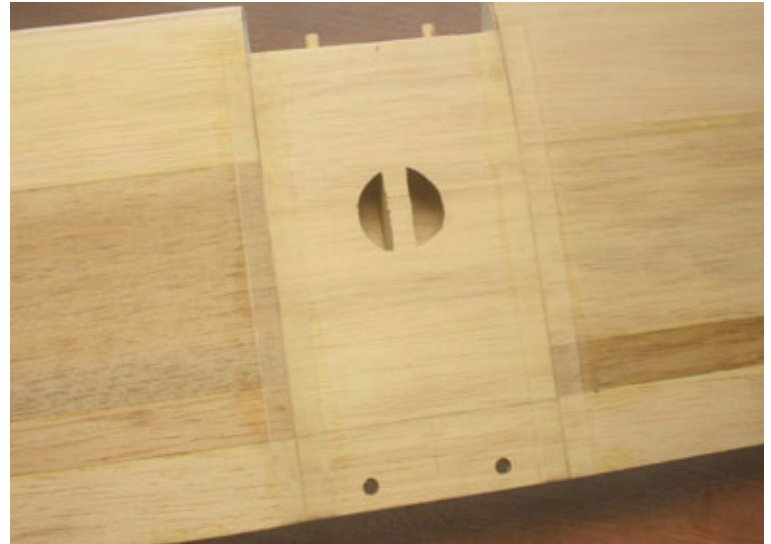


111...Sand the joint between the wings and the center section. Test fit the wing onto the fuselage and sand the wing as required to produce a good fit if needed.



At this point there should be gaps between the fuselage sides and the wing leading edges.

112...Use the W-24's glued to the end of the W-7 ribs to fill these gaps. Sand them so there is about a 1/32" gap between the ribs and the fuselage. This small gap is needed to allow for the thickness of the covering material.



113...Cut the 1" dacron tape in half. Glue the tape on the wing. Start at W-5. Tack the end down, centered on the joint. Now pull the tape tight and tack to the trailing edge. Wrap the tape around the trailing edge and pull tight forward and tack at W-5, and trim off any extra. Now use thin C/A glue to attach the tape to the wing. Use adequate ventilation. Now sand the wing smooth all over.

Building the Tip Floats:

114...Glue T-1 and T-2 together.



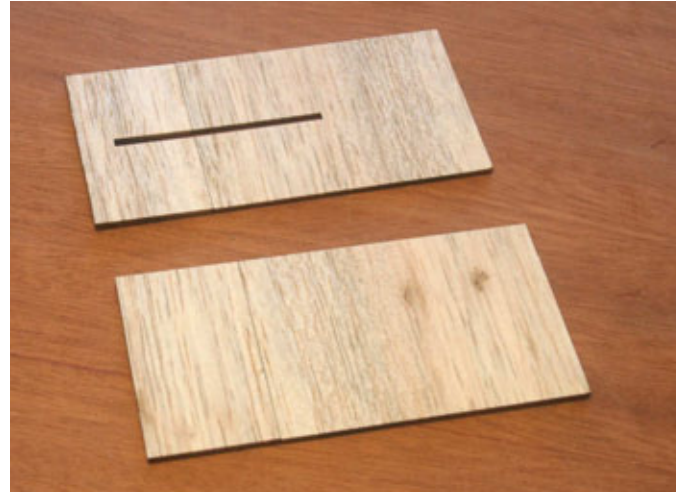
115...Glue T-3, T-4, T-5 and T-6 to T-2. Make sure that these parts are straight and square to T-2.



116...Glue the T-3 sides in place on both sides of the tip float.



117...Glue T-8A and T-8B together as shown. Glue T-9A and T-9B together as shown.



118...Glue T-8 to the bottom of the tip float. It will be a little oversize. Center it left and right and front and back.



119...Slide T-9 down over T-1. Pull the back end of T-9 down and glue it to T-6. Pull the front of T-9 into contact with T-3. Now glue T-9 to T-3, T-4, T-5 and T-2.



120...Trim and sand T-8 and T-9 flush with the sides and ends of the tip float.



121...Cut the 3/4"x 1" x 5" balsa blocks into two 2-1/2" lengths. Glue these to the front of the tip floats.

Cut the 1/2"x 3/4" x 5" balsa blocks into two 2-1/2" lengths. Glue these to the back of the tip floats.



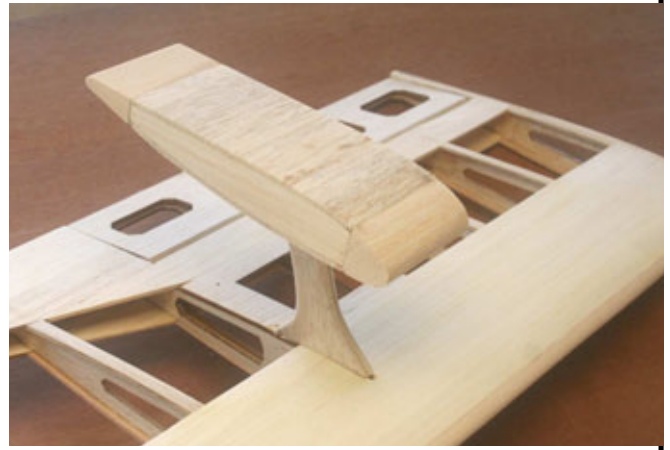
122...Sand the front and rear of the tip floats to the shape shown on the plan. Then sand the sides flush.



123...Glue a T-10 to each side of T-1. Sand the front and back edges round.



124...Test fit the tip floats into the W-13 ribs. Do not glue them to the wing at this time.

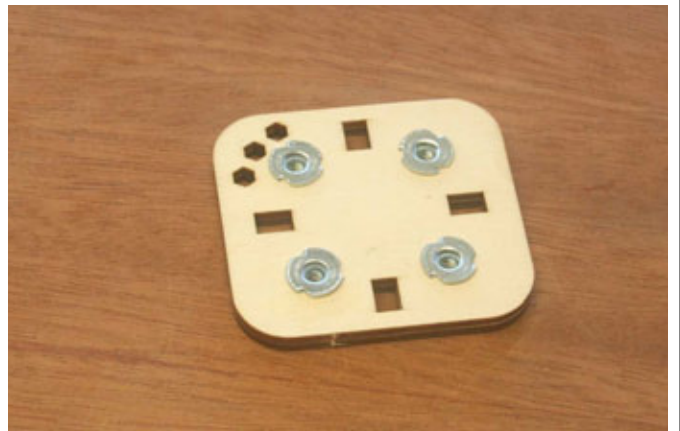


Building the Motor Pylon:

125...Glue the two P-1's together. Glue the two P-2 and the two P-3's together



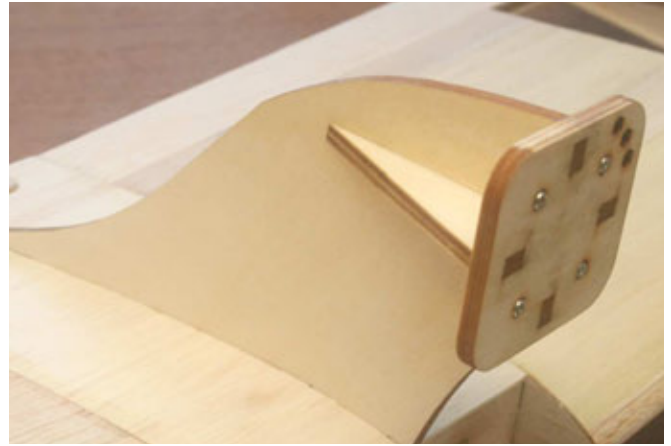
126...Press the four 6-32 blind nuts into the holes in the back of the firewall (P-3). Secure them with a small drop of thin C/A glue.



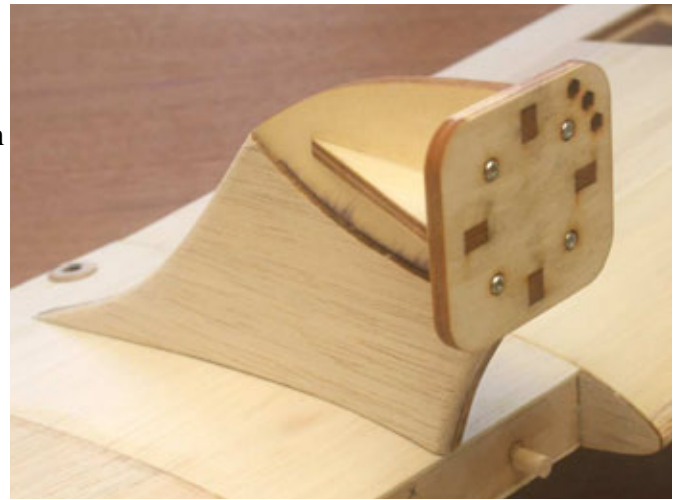
127...Slide P-2 into the slot in P-1. Place P-3 on the front of P-1 / P-2 and glue these parts securely together.



128...Test fit the pylon onto the wing. Sand and trim the wing or pylon if required to get a good fit. Do not glue.



129...Glue the P-4's to the side of P-1. Sand the front and back edges round. Test fit the pylon onto the wing. It should sit down tightly against the top of the wing. Do not glue at this time.



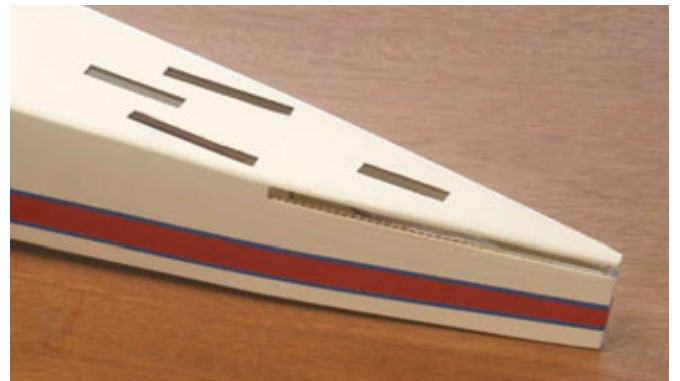
Covering:

130...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 plastic iron on covering material. Overlap all seams approximately 1/8" to assure a water tight seal.

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

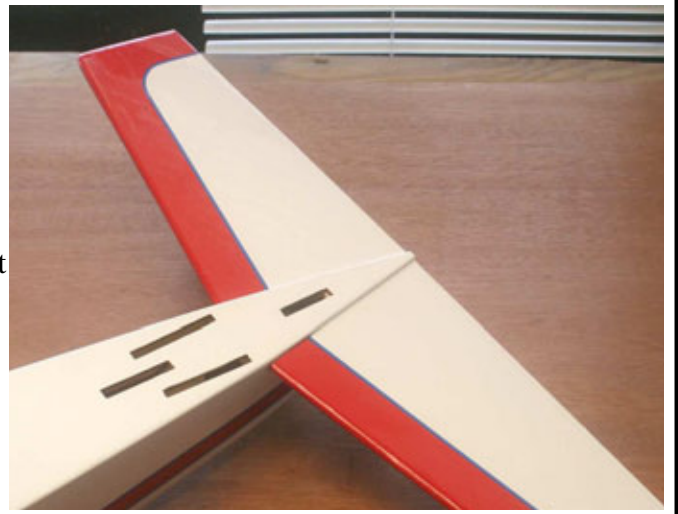
Final Assembly:

131...Cut the covering away from the stabilizer, fin and pushrod slots in the fuselage.



132... Cut the covering away from the stabilizer in the area that makes contact with the fuselage.

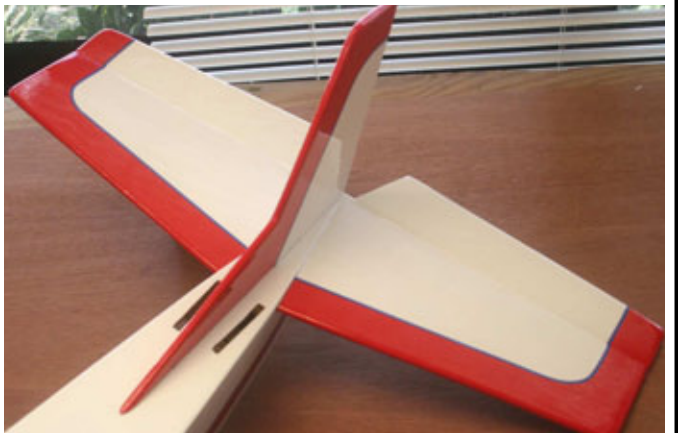
Place the stabilizer into position in the fuselage. Make sure that it is straight and square and then glue it into position.



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



134...Attach the elevators with the hinges and glue in place.



135...Attach the rudder with the hinges and glue in place.



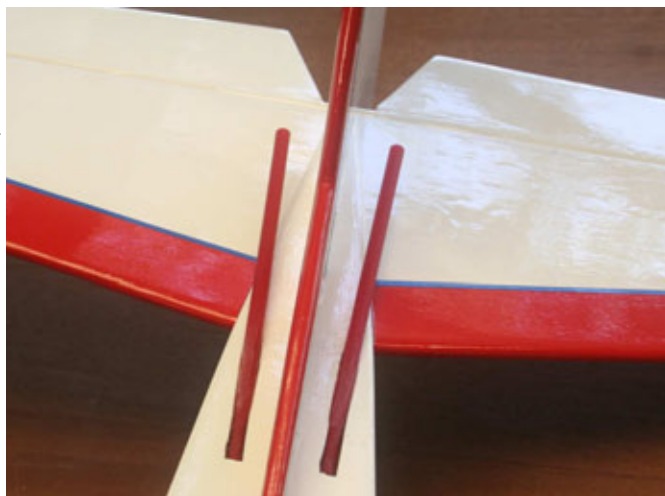
136...Cut the covering away from the fuselage and the lower fin in the areas where they contact. Glue lower fin to fuselage and hinge to the rudder.



137...Screw the servos to the servo tray.



138...Insert the pushrod housings into the exit slots in the back of the fuselage. They should stop 1-3/4" forward of the hinge lines.



The front ends of the pushrod housings should pass thru the slot in former F-7 and be cut off 2" from the center of the servo arms.

Glue the housings to the rear exits. Seal around them where they exit the fuselage with clear silicone for water proofing.

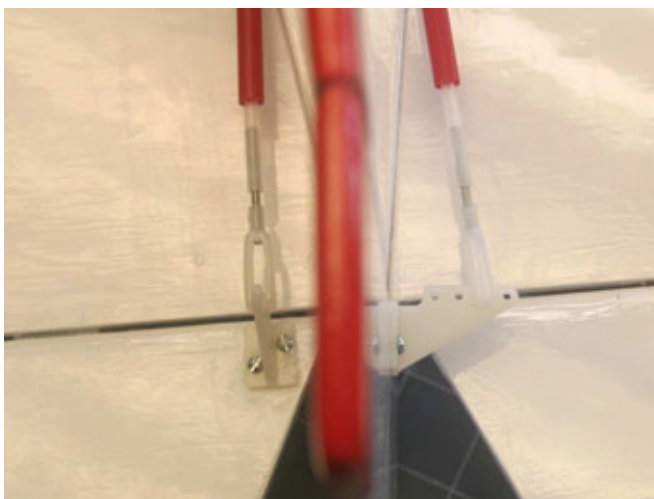
Do not glue the front ends to the former at this time.



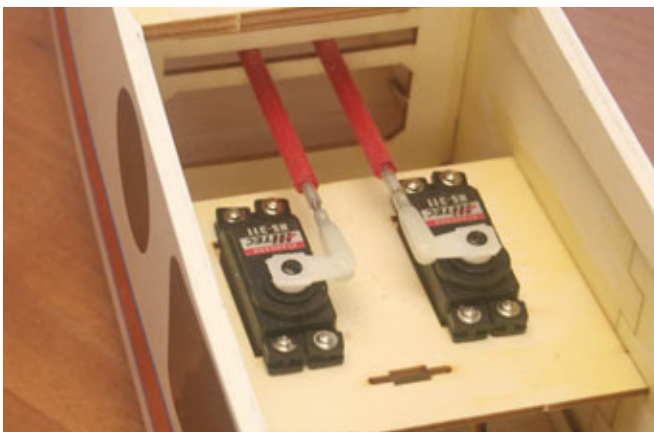
139...Assemble the back end of the pushrods using short pieces of threaded rod and large clevises.



140...Attach the control horns to the elevator and rudder with **2-56 machine screws** and back plates. Slide the pushrods into the housings and connect the clevises to the horns.



141...Assemble the front ends of the pushrods and connect them to the servo arms. The control surfaces should be in neutral when the servos are centered.

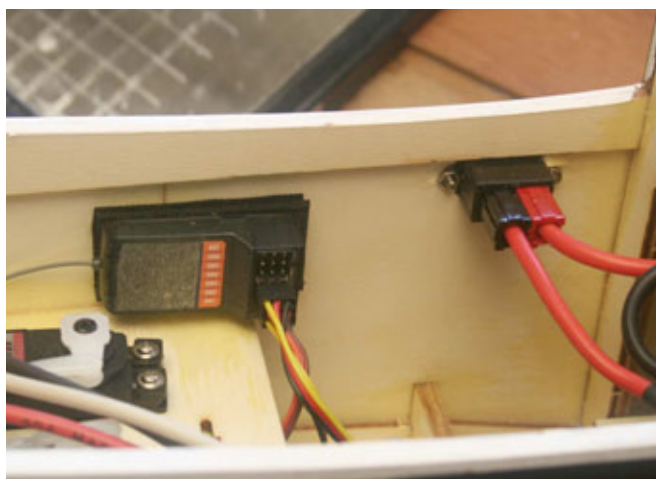


Glue the pushrod housings to former F-7.

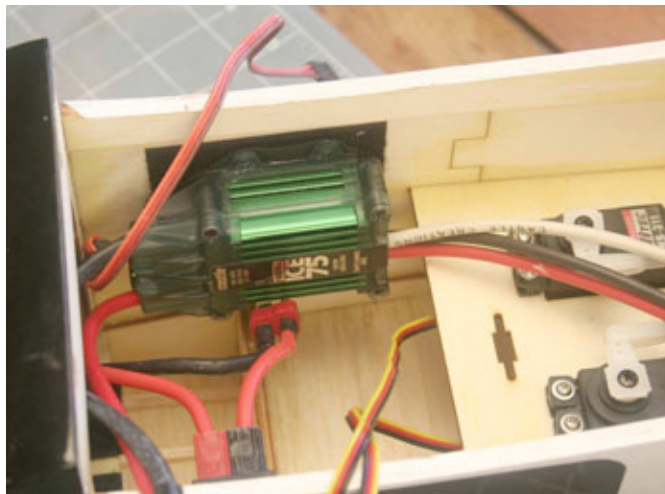
142...Mount the arming switch to the fuselage side.



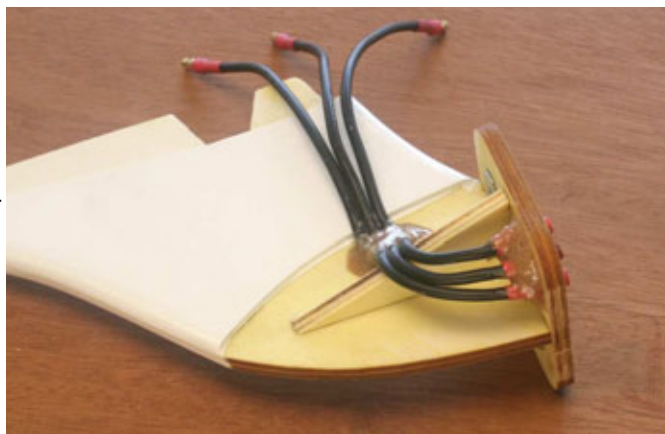
143...Secure the receiver to the fuselage with velcro. Plug the servos into the receiver. Run the antenna back in accordance with the radio's instructions.



144...Attach the speed controller to the fuselage side with velcro. Plug the speed controller into the receiver and arming switch.



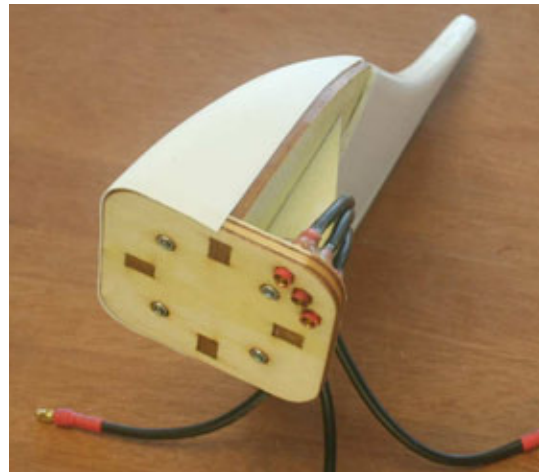
145...Insert the female ends of the motor wire extensions into the holes in the firewall. Securely glue them in place with thin C/A. Use epoxy to build up a fillet in the back side for additional security. Secure the the wires where they exit the pylon with epoxy as shown.



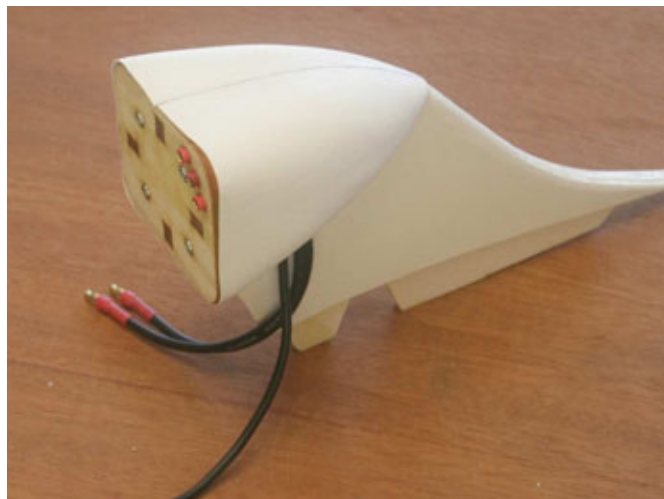
146...Trim the plastic nacelle halves on the trim lines as shown. The bottom edge is 3/32" shorter than the top edge.



147...Glue the left nacelle side to the pylon. The plastic piece should be centered on P-1 on top. The bottom edge is down against P-1 and on top of P-4.



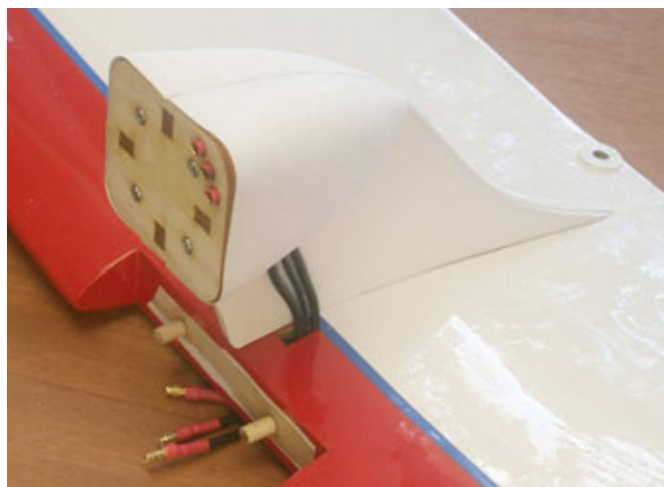
148...Glue the left nacelle side to the pylon. The plastic piece should be centered on P-1 on top. The bottom edge is down against P-1 and on top of P-4. Cut a hole in the lower edge motor wires to pass through. Seal the wires in the exit hole with clear silicone.



149...Cut the covering away from the pylon slot in the top of the wing. Cut a hole in the top and bottom wing sheet for the motor wires.



150...Securely glue the pylon to the wing. Pass the motor extension wires through the hole in the wing. Seal the wires in hole with silicon rubber.

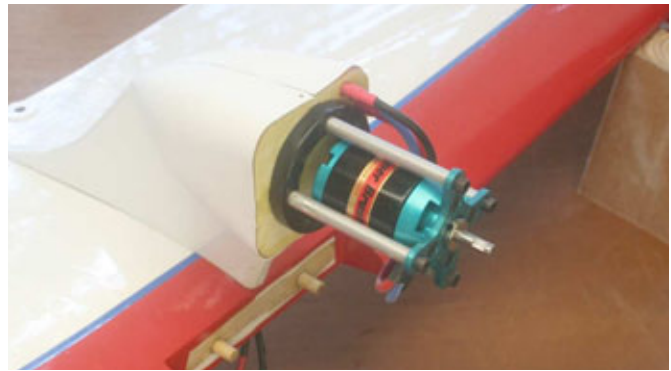


151...Trim the cowl halves on the trim lines marked.



152...Tape the cowl halves together with the right side inside the top. The left side should overlap the right side 1/8" to 3/16". Test fit to the pylon to make sure the cowl slips over the nacelle. Glue the left and right cowl halves together. Trim the prop shaft opening in the front.

153...Assemble the motor and mount. Bolt the motor to the firewall with 6-32 x 1/2" screws. Use a thread locker on all of these screws.



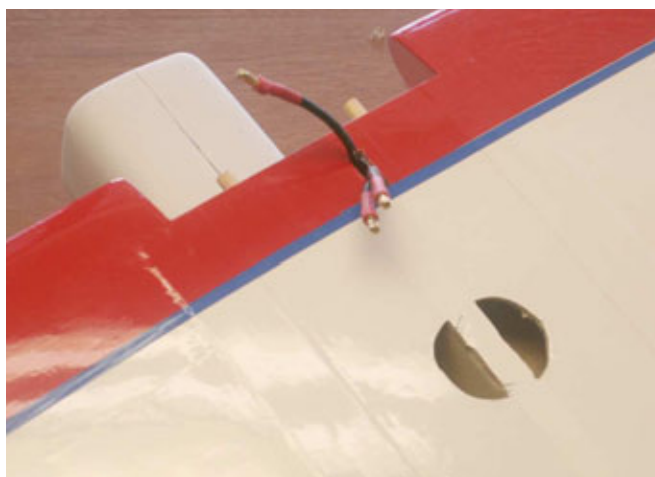
154...Fit the cowl onto the pylon. Center the prop shaft in the front and make sure the cowl is far enough back to allow propeller clearance. Secure the cowl to the nacelle with three #2 sheet metal screws. One centered on the top and one on each side about 1/4" from the bottom. The screws should be centered on the P-3 firewall. NOTE: Use caution not to run these screws into the motor wires.



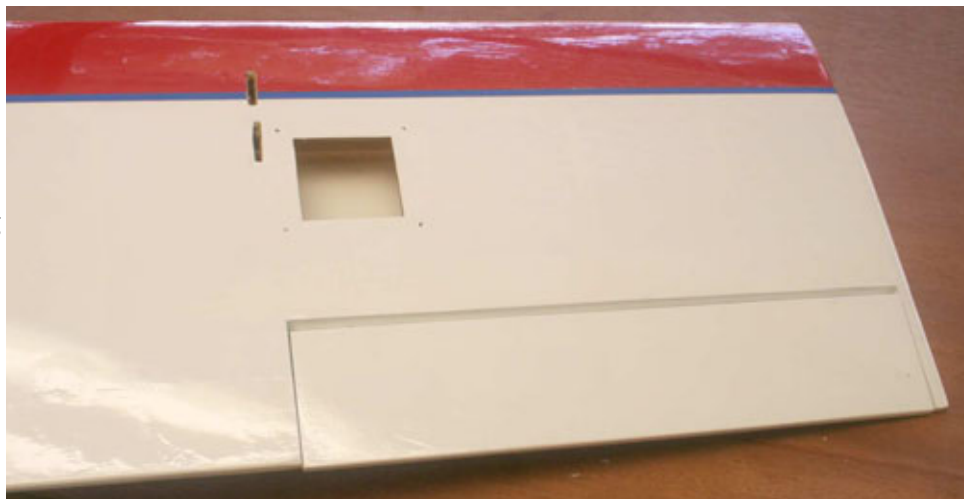
There will be a gap between the cowl and bottom of the firewall. This gap will allow cooling air to exit the cowl.



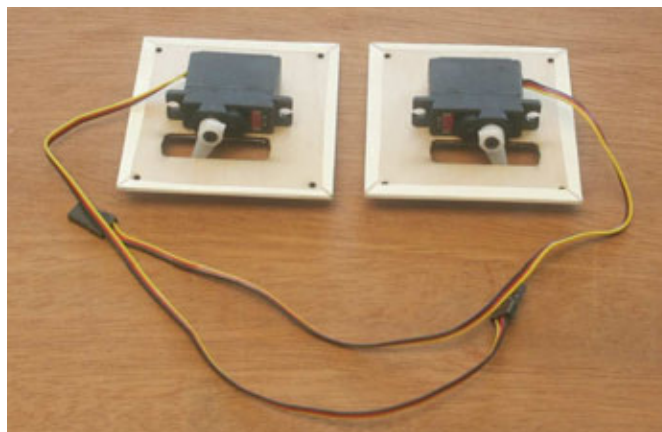
155...Remove the covering from the aileron wire holes in the bottom of the wing.



156...Attach the ailerons to the wing with the hinges and glue in place. Cut the covering away from the aileron servo opening and the tip float slots.



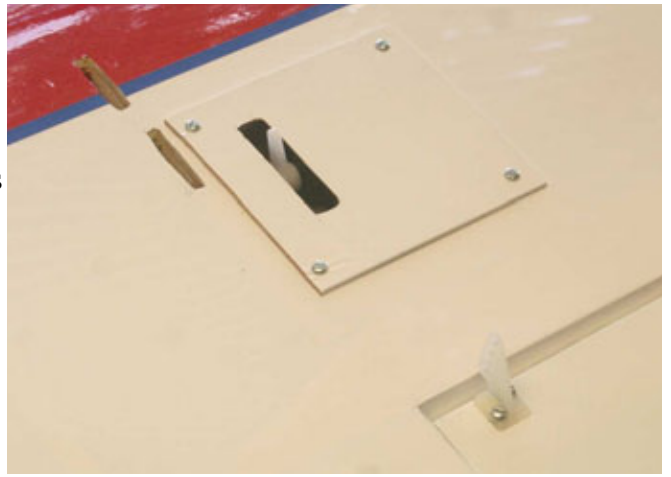
157...Glue the servos into position on the W-25 mounting plates. The servo arms should be angled 30 degrees forward to the plate when the servo is in neutral. Be sure to make a left and a right hand assembly.



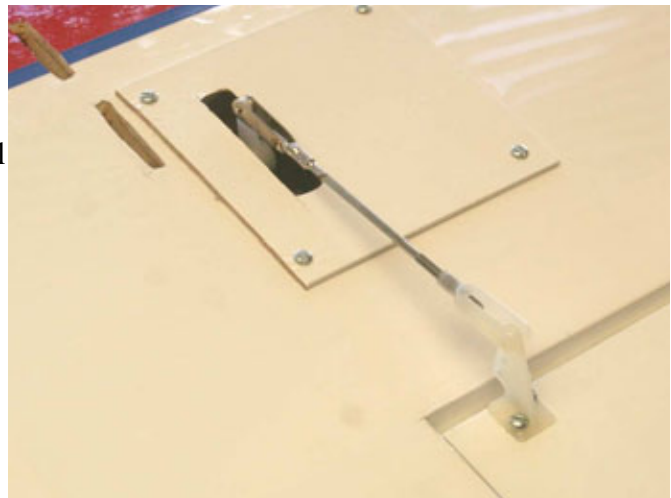
158...Screw the servo mount plates to the wing. The servo arms should be forward and inboard as shown. Use the strings in the wing to feed the servo wires through the wing and out the center section.



159...Screw the aileron control horns to the bottom of the ailerons in the position shown on the plan. **Use #2 sheet metal screws.** Use epoxy on the screws to secure them in place.



160...Assemble the aileron pushrods as shown on the plan. Install the pushrods making sure the ailerons are in neutral when the servos are in neutral.



161...Glue the tip floats to wing.



162...WITH THE PROPELLER REMOVED AND THE ARMING SWITCH DISABLED...Turn the transmitter on. Place the throttle stick in the low position. Plug the battery into the arming switch. Attach the wing to model. Check the motor for proper operation and direction of rotation. Follow the instructions with the speed controller to make any adjustments.

163...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.

164...Place the battery in the nose of the model. Attach the propeller. Attach the wing onto the fuselage.

165...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 velcro to secure the battery in the model in this position. 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.

166...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.

Single vs Dual Battery Note:

We recommend using a single 4 Cell, 5000mAh LiPo battery to power the model. You will need an extension between the arming switch and the battery. This extension should use wires no smaller than 12awg.

You can also use two smaller batteries, WIRED IN PARALLEL, to power the model. In this case, use two 4 cell, 2500mAh LiPo batteries. These batteries MUST BE THE SAME BRAND, THE SAME CELL COUNT, THE SAME MaH CAPACITY AND SHOULD BE THE SAME AGE.

WARNING:

DO NOT USE BATTERIES WITH DIFFERENT CELL COUNT TOGETHER

DO NOT USE BATTERIES WITH DIFFERENT CAPACITY TOGETHER

DO NOT USE AN OLD AND A NEW PACK TOGETHER

DO NOT USE BATTERIES OF DIFFERENT BRANDS TOGETHER

NOTES ABOUT THE BATTERY HATCH:

The battery hatch must be held in place very securely. The propeller moves a lot of air over the hatch producing a lot of force trying to pull the hatch free. The hatch also has to be waterproof. The best way to hold the hatch in place is to use tape on all four sides. We recommend using new tape on the hatch for every flight. Vinyl tape or pieces cut from trim sheet that matches the covering work well. The tape should be at least 1/2" wide and be centered on the hatch seams.

Using tape to hold the hatch in place is somewhat bothersome to remove and apply for every flight but it is the very best way to safely secure the hatch. Using the required arming switch allows you to install a new battery well in advance of your next flight without having any of the electrical components powered up.

Magnets are not a good option to hold the hatch in place. If you use magnets that are strong enough to safely hold the hatch in place during flight, you will break the hatch or damage the fuselage trying to remove it.

NOTES ABOUT THE ARMING SWITCH:

***YOU MUST USE THE ARMING SWITCH. THIS IS AN IMPORTANT SAFETY ITEM.**

***THE PLUG SHOULD ONLY BE INSERTED IN THE ARMING SWITCH IMMEDIATELY PRIOR TO FLIGHT.**

***ALWAYS REMOVE THE PLUG FROM THE ARMING SWITCH IMMEDIATELY AFTER EVERY FLIGHT.**

***THE PLUG SHOULD NEVER BE INSERTED IN THE ARMING SWITCH WHILE CHANGING OR INSTALLING THE BATTERY IN THE MODEL.**

***BE ABSOLUTELY SURE THAT THERE ARE NO OBJECTS, CLOTHING, BODY PARTS, ETC. ANYWHERE NEAR THE PROPELLER AND THAT THE MODEL IS SECURELY RESTRAINED BEFORE INSTALLING THE PLUG IN THE ARMING SWITCH.**

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. Only 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.