C-310-B

KIT # K-201

Assembly Instructions

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.
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:

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<th>Qty.</th>
<th>Name</th>
<th>Description</th>
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<tr>
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<td>LC-201-01</td>
<td>.1/16” X 4” X 24” Laser Cut BALSA</td>
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<td>LC-201-02</td>
<td>.1/16” X 4” X 24” Laser Cut BALSA</td>
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<td>LC-201-03</td>
<td>.1/16” X 4” X 24” Laser Cut BALSA</td>
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<td>LC-201-04</td>
<td>.1/16” X 4” X 24” Laser Cut BALSA</td>
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<td>LC-201-05</td>
<td>.1/16” X 4” X 24” Laser Cut BALSA</td>
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<td>LC-201-13</td>
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<td>LC-201-14</td>
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<td>LC-201-15</td>
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<td>.1/16” X 3” X 12” Laser Cut BIRCH PLY</td>
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<td>LC-201-17</td>
<td>.1/16” X 3” X 6” Laser Cut BIRCH PLY</td>
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<td>Main Wing Spars</td>
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<td>Wing Leading Edges</td>
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<td>Fuselage Stringers</td>
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<td>4</td>
<td>Stringer Spars</td>
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<td>Nacelle Corners</td>
<td>.1/4” Triangle X 24” BALSA (MAY BE FOUR 12” PIECES)</td>
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<td>Wing Sheeting</td>
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<td>Landing Gear Wire</td>
<td>.1/16” X 15” MUSIC WIRE</td>
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<td>Laser Cut Windshield &amp; Windows</td>
<td>.010 X 3” X 12” Laser Cut Plastic</td>
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Hardware Bag

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<td>#2 X 1/2” Sheet Metal Screws</td>
<td>.Nose block Screws</td>
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<td>.1/8” x 3” Birch Dowel</td>
<td>.Elevator Joiner</td>
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<td>Control Horn</td>
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Misc. Loose Parts

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<tr>
<td>1</td>
<td>K-201 PLAN C</td>
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</table>
**Kit Contents:**

**Continued**

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.

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<td>Speed Controls</td>
<td>Castle Creation's Thunderbird-9 Electronic Speed Control (Alien Aircraft P/N: AE-004) with connectors matching motor &amp; battery</td>
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<td>Tail Pushrods</td>
<td>Dubro Micro Pushrod Set (Alien Aircraft P/N: AH-001)</td>
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<td>Aileron &amp; ESC “Y” Harness</td>
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<td>Speed Control “Y” Harness</td>
<td>One Dean's Ultra Male to Two JST Female &quot;Y&quot; Harness (Alien Aircraft P/N: AE-033)</td>
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<td>.1 Roll Light Weight Covering Material Plus Trim Colors</td>
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<tr>
<td>1</td>
<td>Radio</td>
<td>.4 Channel Radio with 4 micro servos &amp; Receiver</td>
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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-1 and R-2 together. Sand the outside edges round. Leave the back and fuselage edges square.

Glue R-3 and R-4 together. 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. Temporarily install the hinges without glue.

2...Glue the S-3’s to S-2. Join the elevators (S-2/S-3) using the 1/8”x 3” dowel. Use the stabilizer (S-1) as a guide. Trim the dowel if required to achieve the proper length.

Bevel the front edge of the elevators 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.

**Building the Fuselage:**

3...Glue parts F-2 to the front of parts F-1. Glue the F-3 doublers to the inside of parts F-1/F-2 to finish the fuselage sides. Be sure to make a right hand and a left hand side.

4...Tack glue parts F-4 and F-5 to the right fuselage side with several small drops of glue. The small “X” marks the top of F-4. The formers should be 90 degrees to the fuselage sides.

**NOTE:** The doublers installed in the last step are on the inside of the fuselage sides.
5...Lightly tack glue the left fuselage side to the F-4 and F-5 formers.

6...Glue parts F-6A and F-6B together.

7...Glue part F-6 into position on the top of the fuselage between formers F-4 and F-5. Make sure the fuselage is straight and square.

8...Glue the two F-7 servo trays into position on the fuselage sides and against former F-5. Make sure that they are level (parallel with slots in F-5). Make sure the fuselage is straight and square and thoroughly glue formers F-4 and F-5 to the fuselage sides.

9...Cut the former braces for formers F-8 and F-9 from one of the 3/32” sq. X 18” balsa strips and glue them onto the formers in the locations marked by the dashed lines.
10...Moisten the outside of the fuselage sides forward of former F-4 with water. Place formers F-8 and F-9 into position and hold the front of the fuselage sides together with a rubber band. Lightly tack glue the formers to the fuselage sides.

**IMPORTANT...** Position formers F-8 and F-9 with the braces on the back side as shown on the plan. The photos show the braces on the front and this is wrong.

11...Glue F-10 into position on the top of the fuselage between formers F-4 and F-8. Wiggle the fuselage sides as required to achieve the proper fit and keep the front of the fuselage straight and square.

12...Glue F-11 into position on the bottom of the fuselage between formers F-4 and F-8. Wiggle the fuselage sides as required to achieve the proper fit and keep the front of the fuselage straight and square.

13...Glue F-12 into position on the top of the fuselage between formers F-8 and F-9. Wiggle the fuselage sides as required to achieve the proper fit and keep the front of the fuselage straight and square.

14...Glue F-13 into position on the bottom of the fuselage between formers F-8 and F-9. Wiggle the fuselage sides as required to achieve the proper fit and keep the front of the fuselage straight and square.
15...Place a piece of wax paper on your building board. Place former F-16 on the wax paper. Hold the fuselage vertical on the building board over the former. Make sure that the front edges are flat on the building board.

Squeeze the fuselage sides together into the notches in the former. Make sure that the former and the fuselage ends are flat on the building board.

Make sure everything is straight & square and glue the former to the fuselage sides.

16...Glue F-14 into position on the top of the fuselage between formers F-9 and F-16. Wiggle the fuselage sides as required to achieve the proper fit and keep the front of the fuselage straight and square.

17...Glue F-15 into position on the bottom of the fuselage between formers F-9 and F-16. Wiggle the fuselage sides as required to achieve the proper fit and keep the front of the fuselage straight and square. Thoroughly glue formers F-8 and F-9 to the fuselage sides.

18...Use the remaining 3/32” sq. strip from step 9 to make the braces for former F-18 and glue them into position.
19...Pull the rear of the fuselage sides together. Place former F-17 into position. Hold the rear of the fuselage together with a clothes pin. Adjust the back of the fuselage straight and square with the aft end vertical. Glue the former into position and glue the fuselage sides together.

20...Place former F-18 into position. Pull the fuselage sides into contact with the former and glue it in place.

21...Place part F-19 into position on the bottom of the fuselage. Make sure that the fuselage stays straight and true. Glue F-19 to the formers. Now, working from the front to the rear, gently squeeze the fuselage sides into contact with F-19 and glue in place.

22...Place F-20 into position on the fuselage top between formers F-5 and F-18 and glue in place.

23...Place F-21 into position on the fuselage top between formers F-17 and F-18 and glue in place.
24...Place F-22 into position on the fuselage top and glue in place.

25...Place formers F-23 and F-24 in place on the top of the fuselage. Make sure that they are centered and 90 degrees to the fuselage top and glue into position.

26...Using 3/32” sq. X 18” balsa strips, cut, fit and glue the nine full length stringers between formers F-5 and F-17. Place the strips full length into position with the back end flush with the back of F-17 and the excess extending forward of F-5. When the glue is dry, trim the front ends flush with F-5. Save the cut off ends for use on the front of the fuselage.

Now glue the two short stringers between F-5 and F-23.

27...Using the cut off extra 3/32” sq. strips from the last step, glue the stringers on the top front of the fuselage between F-4 and F-16. Use additional 3/32” sq. X 18” strips if required to complete this step.
28...Using 3/32” sq. X 18” balsa strips, cut, fit and glue the stringers to the bottom of the fuselage between formers F-4 and F-16. Trim each stringer on assembly and use the cut off piece for the next stringer.

29...Glue F-25 to the front of F-5. F-25 should be centered on the fuselage with an equal gap on each side where it contacts F-6. Use the center stringer notch at the top to help with the proper alignment.

Glue F-26 into position in the slots in part F-6. It should be 90 degrees to the top of the fuselage.

30...Glue one F-27B to the back each F-27A. Make sure that you make both right and left hand parts. Align the outside edges. There will be a step in the window cutouts. It should be equal all of the way around the window openings.

31...Glue F-28 into position on the top of the fuselage and in contact with F-4. It should be centered with an equal gap at each side where it contacts the fuselage top. Use part “X” to establish the proper angle. The point on the front of “X” should touch former F-4. Do not glue part “X” to the model.

32...Place the left F-27 assembly into position. The 1/32” F-27B should be on the inside and the 1/16” F-27A should be on the outside. Glue the bottom edge to the top of the fuselage between F-25 and F-26. Pull the front end into contact with F-28 and glue to the top of the fuselage.
33...Moisten the outside surfaces of F-27 with water. Gently pull the middle of F-27 into contact with F-26 and glue it to the former. Pull the back end into contact with F-25 and glue in place.

Pull the front into contact with F-28 and glue in place. You can wiggle former F-28 to adjust it so that it matches the angle on the front of F-27, however F-27 will extend slightly past the front of the former.

Now repeat the last two steps to glue F-27 to the right side of the fuselage.

34...Using 3/32” sq. X 18” balsa strips, cut, fit and glue the stringers to the top of the fuselage between formers F-25 and F-28. Trim each stringer on assembly and use the cut off piece for the next stringer. When the glue is dry, trim the stringers and both F-27’s flush with the front of F-28.

35...Glue the two F-29’s together, Glue former F-30 and then F-31 to the two F-29’s.

Glue the remaining F-30 to the front of F-31.

36...Sand or cut the taper in the two F-29’s as shown on the plan.
37...Glue the F-29 / F-31 assembly to the front of F-16. The bottom should be flush with F-16. The top edge should be level across the front of F-16.

38...Glue the F-32’s together to make the nose block.

39...Cut the pattern from the plan and mark the top profile onto the nose block.

40...Rough trim the top profile into the nose block. Don’t trim too much. Leave slightly oversize.

41...Place the nose block on the front of the fuselage. Center it left and right and securely glue to F-16 and F-29 / F-31.
42...Start shaping the nose block by trimming off the corners at approximately 45 degree angle. Now trim off the corners at the edges of the first cut.

Trimming of the blocks on this model can be done using a hobby knife, razor plane or sand paper.

43...Sand the nose block to the final shape. Sand the fuselage sides, top and bottom smooth from the nose back to former F-4. Do not sand the cabin area or the rear of the fuselage at this time.

44...Glue the P-1’s to the P-2’s. Use a small square to make sure that the P-1’s are 90 degrees to the P-2’s.

45...Draw a centerline on the back of former F-17 and on the top of F-22. Use two small spots of glue to temporarily attach the two P-1 / P-2’s spacers to F-22. The upright P-1’s should be centered on the centerline marked on F-22 / F-17.

46...Glue six F-33’s together to make one side of the tail block. Glue the other six F-33’s together to make the other side of the tail block.
47...Glue the tail blocks to the back of the fuselage. Glue them securely to F-17. Use one small drop of glue to hold the tail blocks to the P-1 / P-2 spacers.

48...Trim the tail blocks to the top profile of the fuselage.

49...Now sand the tail blocks to shape. Trim the back ends so that they end 1/2” from the aft end of the fuselage.

Now trim the P-1 / P-2 spacers free and remove them.

50...Test fit the tail surfaces to the fuselage. Trim as required to achieve the proper fit. Cut the hinge slot in the fuselage for the lower rudder hinge.

51...Glue the four F-34 pieces together. Glue F-35 to this stack. The front (curved) edge should be flush and the back edge should be parallel to the F-34’s.

52...Trim or sand the angle on the back of the pieces as shown on the plan.
53...Glue this block to the top front of F-28. The outside ends should be even with the outside of parts F-27. The bottom should be parallel to the cutout in part F-28.

54...Trim and sand the top of this block to match the front profile of F-28.

55...Now shape the block to match the side profile as shown on the plan.

56...Sand off the remaining corners and sand the block to its final shape.
57...Sand the fuselage sides, bottom and top smooth from F-4 / F-28 back to the tail. Round off the bottom corners of the fuselage from the wing opening to the tail.

58...Glue part F-36 to the bottom of F-35. Trim and position it so it is slightly back from the outside edge of F-35 to create a step that the windshield will fit into.

Glue parts F-37 onto the front of F-28. Trim and fit them so that they are in slightly from the outside edge of the fuselage sides to create a step for the windshield to fit in.

Test fit the side windows and the windshield. The side windows should fit into F-27A’s and rest against the F-27B’s.

Trim the fuselage / windshield until you get a good fit.

**Building the Nacelles:**

**NOTE:** The nacelles are identical. The letters “L” and “R” are marked on the nacelle sides. Each nacelle has one “L” and one “R”

59...Press four 4-40 blind nuts into the back of N-2. Secure each with a small drop of thin C/A glue.

60...Cut two pieces of 1/4” triangle 3 1/2” long and two pieces of 1/4” triangle 8 1/2” long from one of the 24” long 1/4” triangle strips.

Glue the 3 1/2” pieces to the bottom edges of one pair of F-1L and F-1R. Be sure the triangle is on the inside face of the nacelle sides.

Trim the triangle from the wing opening as shown.
61...Mark a line 3” back from one end of the 8 1/2” triangle pieces.

62...Make a series of cuts 3/4 of the way thru the triangle from the 3” line in the long end of the 8 1/2 pieces. The cuts should be spaced about 1/4” apart. Be sure to make a right and left hand piece.

63...Place one of the triangles flush with the top edge of N-1L. The cut edge should be against the nacelle side and the un-cut edge should stick up in the air. Glue the first 3” to the nacelle side.

Now work back from the 3” line and bend the triangle so the outside edge is flush with the edge of the nacelle side and glue into position.

64...Repeat this process to glue the remaining 1/4” triangle to the inside of N-1R.
65...Lightly glue parts N-2, N-3 and N-4 to the right nacelle side. They should be 90 degrees to the side.

66...Lightly glue the left nacelle side onto the formers.

67...Place N-5 into position on the bottom of the nacelle. Wiggle everything to square up the nacelle and then glue N-5 into place. Now securely glue the formers to the sides.

68...Make a series of cuts into the edge of the top 1/4” triangle behind N-4. These cuts should be between the cuts made previously in the other edge.

69...Place N-6 into position on the top of the nacelle. Glue to the nacelle from former N-4 forward.
70...Lightly moisten the nacelle sides and the top of N-6 with water. Pull the sides in and glue flush with the edges of N-6.

71...Sand the front of the nacelle so that the top, sides, bottom and triangles are flush with the front of N-3. Sand the top and bottom flush with the sides. **NOTE**...Cut two braces from the scrap from one of the 1/8” sheets and glue to the bottom side of N-6. The plan shows the size and location of these braces.

72...Glue one N-7, two N-8’s and one N-9 together to make the nose block.

73...Attach the nose block to the nacelle using two #2 X 1/2” sheet metal screws.

74...Draw lines on the sides, top and bottom of the nacelle. The lines should be in slightly less than 1/4” in from the edges. You will use these lines as a guide in trimming and sanding.
75...Trim or sand the corners off of the nacelles at a 45 degree angle, connecting the lines drawn in the last step.

76...Trim the corners off of the 45 degree cuts made in the last step.

77...Sand the corners of the nacelles round to match the nose block. Sand the top, sides and bottom of the nacelle smooth and sand the nose block flush.

78...Draw lines around the nose block and on the front about 3/16” in from the edges like you did on the nacelle

79...Trim or sand the corners off of the nose block at a 45 degree angle, connecting the lines drawn in the last step.
80...Trim the corners off of the 45 degree cuts made in the last step.

81...Sand the corners of the nose block round and smooth.

Now remove the nose block from the nacelle.

82...Secure the motor mount to the front of the motor with the four flat head screws. Now bolt the motor to the firewall with 4-40 screws and aluminum tube spacers.

Mark the nose block and nacelle front so you know which nose block fits on which nacelle after covering.

83...Re-attach the nose block to the nacelle. Carefully trim the back of N-9 to clear the motor mount screws if required.

Remove the nose block and motor from the nacelle and set aside until later.

Repeat steps 59 thru 83 to build the other nacelle.

**Building the Wing:**

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

85...Cut one of the 3/32” x 1/4” x 24” balsa spars into two 12” lengths. Glue each of these 12” pieces to one of the 3/32” x 1/4” x 24” balsa spars as shown on the plan.
86...Pin one main spar assembly to the plan with the 12” section on the top. Align the inboard end with the wing centerline. The outboard end will extend past the W-11 tip rib. Pin one of the W-12 trailing edges into position on the plan.

87...Glue the W-2 rib into position on the spar. It should be 90 degrees to the building board.

88...Place shear web “A” into position and glue to the front face of the spar. The small “X” on the shear web marks the top outboard corner.

89...Glue rib W-1 into position. It should be tight against shear web “A” and the top edge will angle slightly toward the wing tip.

90...Glue a W-5B rib to each side of one W-5A rib.
91...Place ribs W-3 thru W-11 into position. They should be 90 degrees to the building board. Glue them to the main spar and the trailing edge.

92...Glue the top main spar into position.

Cut one of the 1/4” sq. X 18” balsa sticks into two 9” pieces. Use one of these 9” pieces for the inboard leading edge (stops at W-6) and glue in place. Use a 1/4” sq X 18” stick for the outboard and glue into place.

93...Glue the two 3/32” sq. X 24” stringer spars into position.

94...Glue shear webs “B” thru “I” into position on the front face of the main spars. The small “X” on the shear webs marks the top outboard corners.

95...Glue two W-13 aileron spars together.
96...Glue the aileron spar into position between ribs W-7 and W-10.

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

98...Cut two pieces 3” x 2 1/4” from one of the 1/32” x 3” x 12” sheets. Use these pieces to sheet the top wing center section. The sheet should be between and flush with the spars, trailing and leading edge.

99...Cut two pieces 3” x 3 3/4” from one of the 1/32” x 3” x 12” sheets. Use these pieces to sheet the top wing nacelle area. The sheet should be between and flush with the spars, trailing and leading edge.

100...Remove the wing from the plan. Trim and sand the spars, leading edge and trailing edge flush with both ends of the wing.
101...Sand the the top of the wing smooth. Do not round the leading edge at this time. Draw a line on the top of the wing on the centerline of rib W-5.

102...Glue the W-14 aileron servo mount to W-7 and the main spar. It should be flush with the rib and the spar.

103...Cut two pieces 3” x 2 1/4” from one of the 1/32” x 3” x 12” sheets. Use these pieces to sheet the bottom wing center section. The sheet should be between and flush with the spars, trailing and leading edge.

104...Cut two pieces 3” x 3 3/4” from one of the 1/32” x 3” x 12” sheets. Use these pieces to sheet the bottom wing nacelle area. The sheet should be between and flush with the spars, trailing and leading edge. Cut the slot for the landing gear in the sheet after the glue drys.

105...Sand the bottom of the wing smooth. Sand the leading edge round to match the shape shown on the plan.
106...Glue the three W-15’s into positions on the top of the wing. When the glue is dry, cut the sheet from the center of the W-15’s.

107...Repeat steps 84 thru 106 to build the left wing.

108...Cut the wood away between the dashed lines and the spars on ribs W-1 to make a slot for the wing joiner.

109...Glue the two plywood wing joiners together.

110...Slide the wing joiner into the slot in the left wing. It should be tight against the spars and tight against the back of the shear web. Do not glue in place at this time.

111...Slide the right wing onto the left. Hold them tightly together and sand the top, bottom, leading edge and trailing edge to match each other.
Test fit the wing onto the fuselage. Sand the leading edge and trailing edge if required so the wing matches the cutout in the fuselage.

NOTE...Run pieces of string thru the wings from the openings in the center section to the servo locations and the motor wire openings. This will allow you to feed the servo and motor wires thru the wing after covering.

**Building the ailerons:**

Build the right aileron.

113...Pin part A-1 to the plan. Glue two A-2’s together and then glue them on top of A-1. It should be flush with the front edge of A-1.

114...Glue the four A-3’s into position.

115...Trim an angle on the top of the A-2’s to match the angle of the A-3’s as shown on the plan.

116...Glue A-4 onto the top of the aileron.
117...Sand the ends, front, top and rear of the aileron flush.

118...Draw a centerline on the front of the aileron. Draw a line 1/8” back from the leading edge on the top and bottom of the aileron.

119...Trim or sand the angles on the leading edge of the aileron from the line on the top to the centerline on the leading edge and from the line on the bottom to the centerline on the leading edge.

120...Mark a centerline on the back of the aileron spar.

121...Mark the hinge locations and cut slots 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.

122...Repeat steps 113 thru 121 to build the left aileron.
Building the wing tips:
123...Glue five T-1’s together and then glue the other five T-1’s together.

124...Glue four T-2’s together and then glue the other four T-2’s together.

125...Glue one stack of T-1’s to each stack of T-2’s. Be sure that you make one left hand and one right hand.

126...Sand the outside edges of the wing tips smooth.

127...Use the pattern on the plan to mark the top profile on each wing tip. Trim / sand the tips to this profile.
128...Mark trim lines on the wing tips approximately 5/16” in from the edges on the sides and on the top and bottom. The lines do not need to go all of the way to the front or back.

129...Trim / sand the corners of the wing tips between the trim lines at a 45 degree angle.

130...Trim / sand the corners on each side of the 45 degree angle cuts made in the last step..

131...Finish sanding the wing tips to a rounded shape.

132...Test fit the wing tips on the wings.
133...Test fit the nacelles on the wings. Mark the inside of each nacelle left or right to match the wing it is going to be attached to.

134...Bend the landing wires to the patterns shown on the plan.

135...Test fit the landing wires to the model by pressing into the slots. Do not glue in position at this time.

Covering:
136...Sand all parts smooth with 400 grit sandpaper. Cover the model with a light weight iron on covering material.

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:

Wing Final Assembly

137...Attach the aileron to the right wing with the hinges and glue in place.
138...Cut the covering away from the aileron servo opening. Cut the covering about 3/32” inside the wooden mount and iron down the excess onto the sides of the opening.

139...Mark the aileron horn location and drill the two 1/16” holes for the pins on the horn. Remove the covering from the horn location and glue the horn in place on the aileron.

140...Plug a 3” extension onto the servo cable. Feed a stiff wire or balsa strip into the rear hole in wing rib W-1. Push into the wing and attach the servo wire to it. Tape the servo wire to the end and gently pull the servo wire thru the wing. Push the servo wire thru the hole in W-15 in the top of the wing. NOTE: Put tape over the servo connectors to streamline them into a smooth, flat bullet shape to make it easier for them to pass thru the wing ribs.

Screw the aileron servo into position.

141...Install the aileron pushrod. Attach the rear of the pushrods to the horns with Mini E/Z Link. The front end is attached to the servo with Mini E/Z Connectors. When the servo is in neutral the servo arm should be 30 degrees forward from straight out. When the servo is in neutral the aileron should be even with the trailing edge of the wing.

142...Repeat steps 137 thru 141 to install the aileron and aileron servo to the left wing.

143...Attach the 12” long motor extension harness to one of the motors.
144...Place the right nacelle into position on the right wing. The nacelle should be centered on rib W-5. The line that you drew on the wing in step 101 should show thru the covering slightly. Mark the nacelle location on the covering and carefully cut the covering away from the wing in the areas that the nacelle makes contact with.

145...Install the motor in the right nacelle.

146...Feed the motor wires thru the wing. Use a stick or wire inserted thru W-1 to pull the wires thru the wing as you did the aileron servo wires.

147...Re-position the nacelle on the wing and glue securely into position.

148...Install the nose block onto the nacelle.
149...Glue the wing tip onto the end of the wing.

150...Repeat steps 143 thru 149 to attach the left nacelle and wing tip to the left wing.

151...Glue the wing joiner into the right 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.

152...Apply epoxy to the wing joiner and inside the left wing. Spread glue on the W-1 rib. Slide the wings together and align the W-1 ribs. Wipe off any excess glue and hold the wings in the proper alignment with several strips of masking tape.

153...Cut a strip of covering material and cover the seam on the bottom of the wing.
137...Tuck the excess motor wires into the wing. Attach the speed controls to the top of the wing with velcro. Plug the speed controls into the receiver with a “Y” connector.

WITH THE PROPELLERS REMOVED...Turn the transmitter on. Place the throttle stick in the low position. Plug the battery into the speed controllers with a “Y” connector. Check the motors for proper operation and direction of rotation. Follow the instructions with the speed controller to make any adjustments. **NOTE: The Thunderbird Speed Controllers can use a standard “Y” connector to the receiver, sharing the B.E.C. function. Many speed controllers CAN NOT. Consult the manufacturer of your speed controller for the correct way to connect two in parallel.**

138...Cut the covering away from the stabilizer in the area that makes contact with the fuselage. Cut the covering away from the stabilizer and rudder slots in the fuselage.

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

140...Carefully cut the covering away from areas on the fin that will make contact with the fuselage.

141...Place the fin into position and make sure that it is straight and square. Glue the fin into position.
142...Attach the elevators with the hinges and glue in place.

143...Attach the rudder with the hinges and glue in place. Trim covering from the bottom of the fuselage and glue the tail skid into position.

144...Screw the servos to the servo tray. Glue the wing dowels into position.

145...Insert the pushrod housings into the exit slots in the back of the fuselage. They should extend out about 2 3/16” from the fuselage sides. The front ends should pass thru the slot in former F-5. Glue the housings to the rear exits. Do not glue the front ends to the former at this time.
146...Glue the rudder and elevator control horns into position. Drill 1/16” holes for the pins to pass thru. When the glue is dry, cut off the excess pins flush.

147...Install the pushrods into the housings. Secure the rear of the pushrods to the control horns with Mini E/Z Links. The front ends are attached to the servos with Mini E/Z Connectors. Glue the pushrod housings to the former.

148...Attach the receiver to the fuselage with velcro. Run the antenna back and out thru a small hole in the rear of the fuselage.

149...Place the windshield on the model. Adjust for the proper fit and hold in place with several small pieces of tape. Use a straight pin to apply small amounts of thin C/A glue to attach the windshield to the fuselage. Remove the tape and then finish gluing in the locations where the tape was.
150...Place the side windows in position on the model. Use the tip of a straight pin to apply thin C/A glue to hold the windows in place.

NOTE: If you are going to hand launch the model you can leave the landing gear off.

151...Install the nose gear into the slot in the nose of the model. Place two small drops of glue into the slot and allow to dry. Press part F-31B into the slot to capture the nose gear wire and glue into place.

Place a small piece of covering material over the slot and iron in place.

152...Put the nose wheel on the model and press the wheel retainer into position. With the retainer in place, cut off the excess wire axle flush with the retainer.

153...Place the nose gear doors into position and glue to the model with a small amount of silicone rubber.
154...Install the main gear into the slots in the wing. Place two small drops of glue into the slot and allow to dry. Press part W-5C into the slots to capture the main gear wire and glue into place. Note: The axles point inboard.

Place a small piece of covering material over the slot and iron in place.

155...Put the main wheels on the model and press the wheel retainers into position. With the retainers in place, cut off the excess wire axle flush with the retainers.

156...Place the main gear doors into position and glue to the landing gear wires with a small amount of silicone rubber.

157...Plug the speed controls and servos into the receiver and check the servos and motors 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.

158...Place the battery in the nose of the model. Attach the propellers. Attach the wing onto the fuselage.

159...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.
159...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.