



SUKHOI CY-27

Construction Guide



Savage Light Industries

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SUKHOI CY-27

You should read this construction guide completely and study the plans to become familiar with all of the assembly steps before you begin construction of the model. There may be some differences between what can be seen in the photos and what is seen on the plans and in the kit pieces. The plans and parts set contain the most recent revisions.

You should not remove any of the laser cut parts from their sheets until you are prompted to do so in this guide. Some of the pieces are small and easily lost while others are delicate and easily broken.

You may use whatever glue that you are comfortable with to build this model. Cyanoacrylate (CA) glue was used for most of the construction on the prototypes. Carpenter's wood glue was used to glue the wing sheeting to the wing ribs and quick-set epoxy glue was used to join the wings and elevon mounts to the fuselage. Medium-set epoxy was used to join the fins to the fuselage and slow-set epoxy was used to join the wings to the fuselage.

For parts of the construction and/or assembly of the prototype that required alignment over the plans, the plan was taped to the backside of a large sheet of glass which is then placed on a flat building surface. The wing spars, ribs and/or assembly jigs were glued directly to the glass. If you want to use another method, make sure that the parts and/or jigs can be securely attached to the building surface.

While all laser cut parts are labeled with their part number, a large portion have also been etched with alignment marks and building hints to help you correctly orient the part during construction. An arrow etched onto a part indicates that the arrow should point to the centerline of the model. The word "front" etched onto a part means the "front" should be toward the nose.

This kit includes the finest contest-grade balsa sheeting available. Even so, there will be differences in density and grain making the sheet stiffer or softer. Carefully inspect the wood prior to construction and separate them according to their intended usage. Use the stiffest wood for the flat portions of the fuselage and save the softer and more flexible pieces for the round portions. Of the 3/32" fuselage sheeting, select the lightest and softest piece for the hatch sheeting as these are lightly built and easily warped.

The exception to this is the 1/16" wing sheeting. For the wing, you'll want to use the stiffer pieces on the section of the wing ahead of the spars so that the wing sheeting doesn't "cup" between the wing ribs giving the wing the so-called "starved horse" look.

This construction guide shows the fuselage sheeting being applied section by section. If you'd rather plank the fuselage with strips of wood, feel free to do so as there is enough wood included in the kit for either method. If you do use the sheet method instead of planking, be careful when sanding so that the rounded lines of the design is preserved. The 3/32" sheeting is thick enough to do this as long as you're careful.

This model was designed to use the Wemotec Minifan 480 fan unit and brushless motors and speed controllers. You can use NiCad, Nimh, or Lipo batteries for the motor batteries. We recommend the use of a separate receiver battery pack for maximum safety and reliability. We also recommend the use of metal-gearred servos for the same reason.

While the model was intended for use with Mini Spring Air 600-series retract units, you can substitute any brand including the Electric Jet Factory mini units or the Jet Hangar Hobbies mini units. If you substitute the Spring Air units, you might have to make up new landing gear mounting plates as these were designed specifically for the Spring Air units.

This kit does not include the landing gear struts or the wire from which they're made. You'll need to obtain 1/8" music wire or whatever size will fit into your retracts and bend them to the proper shape shown on the plans. Do not use soft foam tires as they will dramatically increase the rolling resistance even to the point of preventing the model from taking off the ground. Instead, select moderately firm wheels which will minimize the rolling resistance and allow the model to accelerate quickly.

Elevon Construction

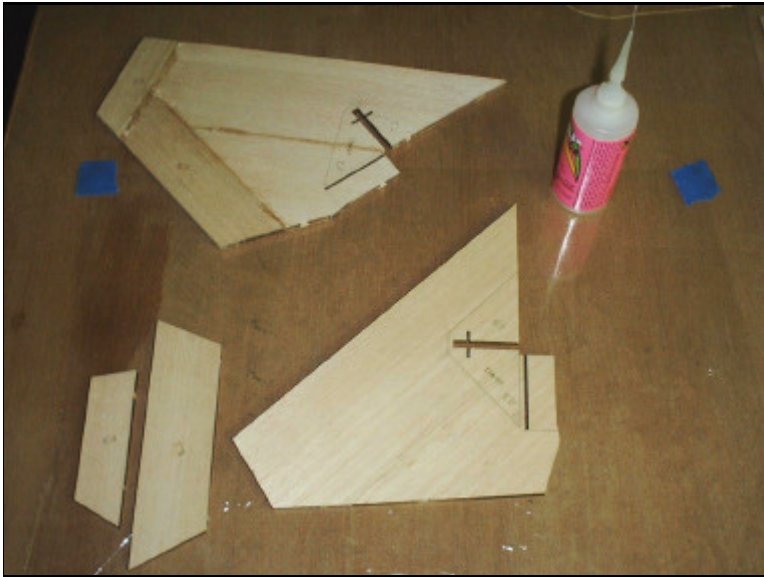


Photo 1

- □ 1. Cut from their sheets two E1, two E2, two E3 and two E4. (3/16" balsa) Lightly sand the edges, then glue together the pieces over sandwich wrap to make an elevon. Repeat for the other side. (Photo 1)

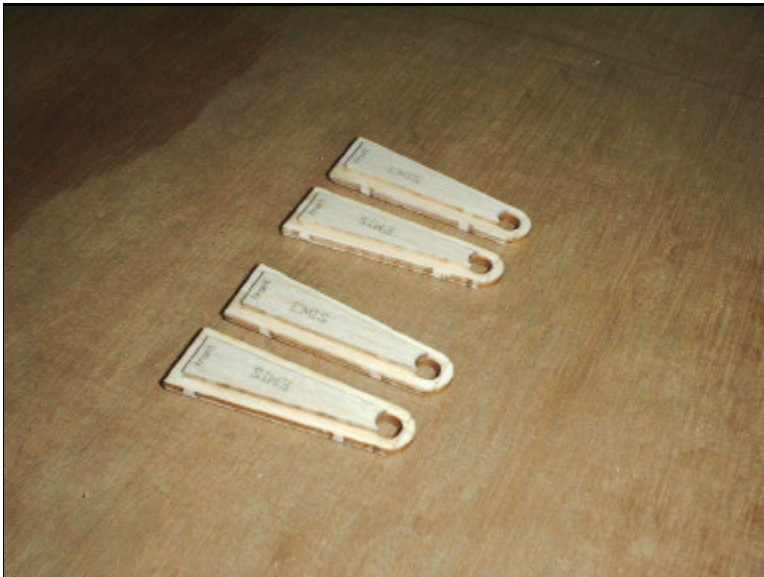


Photo 2

- □ 2. Cut from their sheets two EM2, two EM3, four EM4, two EM5 and two EM6. (1/8" lite ply) Locate the etch lines on EM2 and EM3 and glue an EM4 to the inside of EM2 and EM3. Use an elevon pivot bearing tube (7/32" aluminum tube) to align the pivot bearing holes in EM3 and EM4. Be careful that you make a right and left elevon mount. EM2 goes to the inboard side of each elevon mount. Repeat for the other side (Photo 2)



Photo 3

- □ 3. Using a square, glue the EM2/EM3-EM4 assemblies to the top of EM5. Glue EM6 to the top of the EM2/EM3/EM4 elevon mount side pieces to form a tapered square tube. Use the pivot bearing tube as an alignment tool when gluing the elevon mount side pieces to EM5. Do not glue the pivot bearings into the elevon mounts at this time. Repeat for the other side Set these aside for now. (Photo 3)

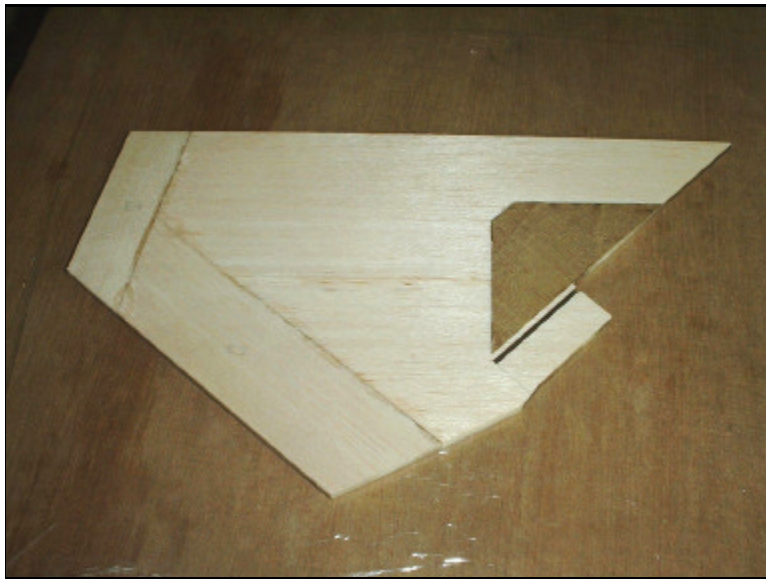


Photo 4

- □ 4. Cut from their sheet four E5 (1/64" birch ply)
Glue one E5 to one side of each elevon. (Photo 4)

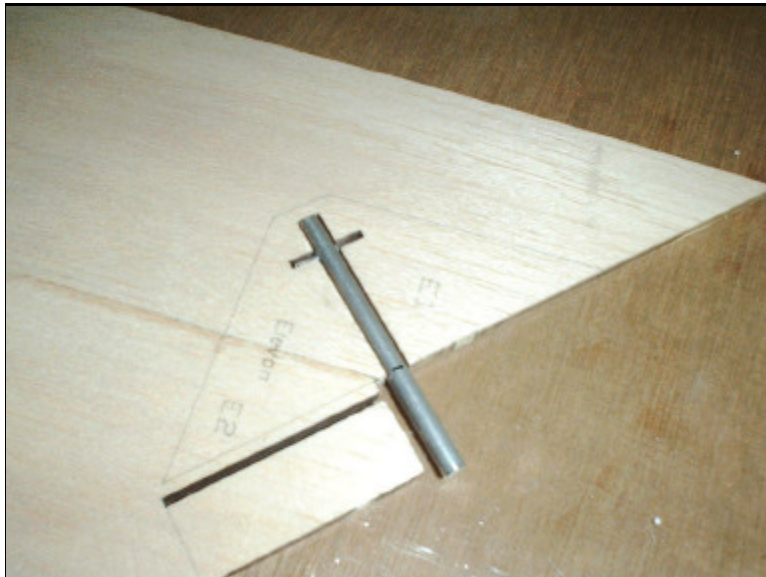


Photo 5

- □ 5. Cut two 2-1/2" elevon pivots from the supplied 3/16" aluminum rod. Cut two 5/8" cross pins from the supplied 1/16" aluminum rod. Drill a 1/16" hole 5/16" from one end of each elevon pivot. Slip the 5/8" cross pin into the holes of each elevon. Check the fit of each of the pivot rods in the elevon pivot pocket in each elevon. When you're satisfied with the fit, lightly scuff the surface of the elevon pivot that will be inside the pocket and glue the pivot rods into the pockets. Make sure that the pivot is parallel to the surface of the elevon by pushing the pivot evenly into the pocket so it rests squarely on the inside of E5. (Photo 5)

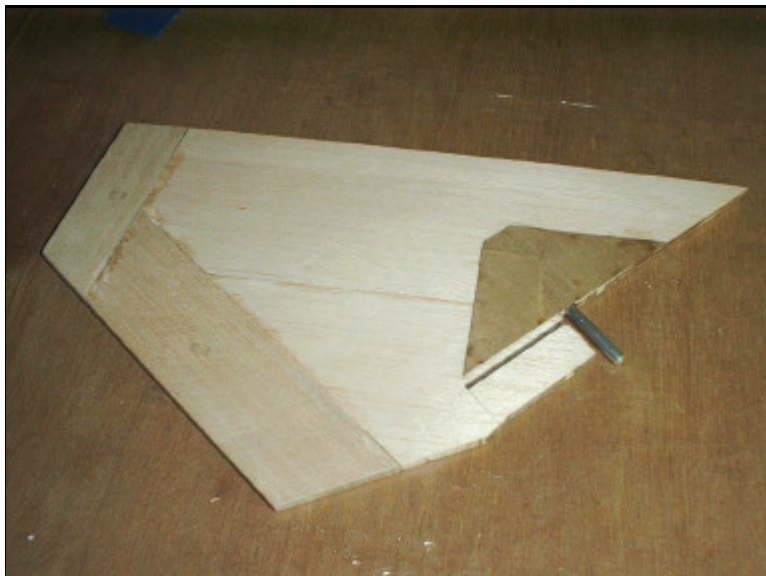


Photo 6

- □ 6. Close the pivot pocket by gluing the other E5 to the elevons. (Photo 6)

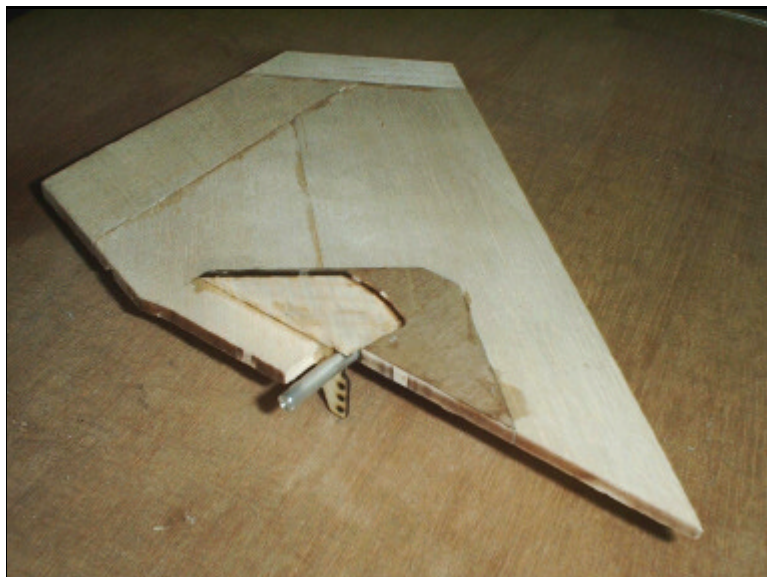


Photo 7

- □ 7. Cut from their sheets two E, (1/16" birch ply) four E7 (1/64" birch ply) and four E9 (1/16" balsa). Fit, but don't glue each E6 actuator/control horn into their slots in the elevons. When satisfied, glue the actuator/horn into the elevon. Make sure to push the actuator/horn forward so it has a tight fit with the elevon pivot rod. Glue an E7 to each side of the upper actuator and an E9 filler to the top and bottom of the elevons inboard of the actuators. Repeat Steps 4-7 for the other side (Photo 7)

Set the elevons aside for the time being. Don't shape them right now as they need to remain flat until after the elevon mounts are glued to the fuselage.

Vertical Fin Construction



Photo 8

- □ 8. Cut from their sheets two each of R1, R2, R3, R4, R5, (3/16" balsa) four R6, (1/8" balsa) and two R7. (1/32" balsa) Glue two R6 pieces to the outside of an R7 to form the upper actuator pocket. Cut from their sheets two F20 (1/32" balsa) and two F21. (1/8" balsa) Glue these together as shown in the plans. Make sure to make a right and left lower elevon actuator pocket. Repeat for the other side. (Photo 8)

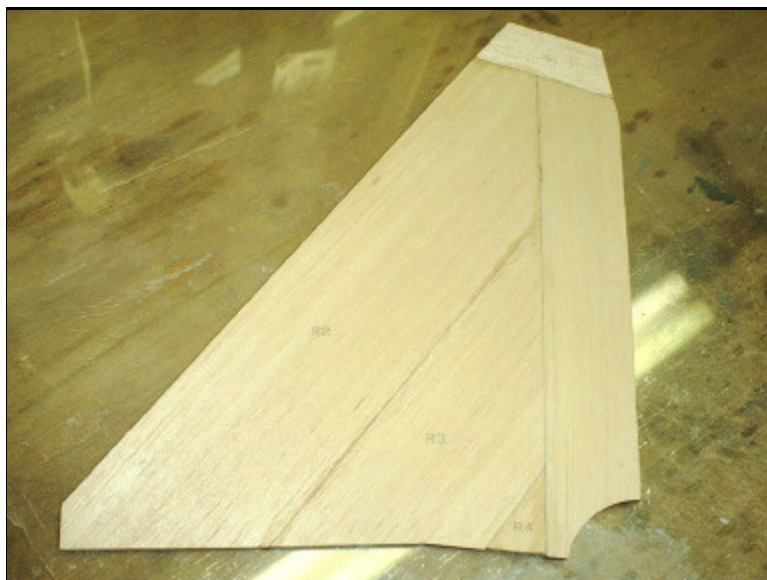


Photo 9

- □ 9. Glue together R1, R2, R3, R4 and R5 to make a vertical fin. Repeat for the other side. (Photo 9)

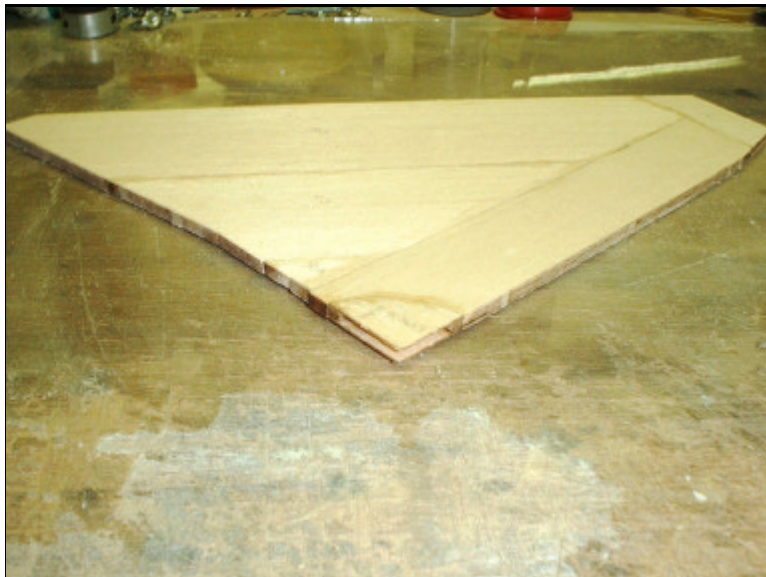


Photo 10

- ☐ ☐ 10. Glue together the vertical fin and the upper actuator pocket. Repeat for the other side. (Photo 10)

Set the vertical fins aside for the time being. Don't shape them right now as they need to remain flat until after they have been fitted to the fuselage.

Sub-Fin Construction

- ☐ ☐ 11. Cut from their sheet two SF1 and two SF2. (1/8" balsa) Glue one SF1 and one SF2 together to make the sub fin. Cut two 5" lengths of 1/4" balsa triangle stock. Streamline the front and back, then position and glue it to the inboard face of the sub-fin. Make sure to make a right sub-fin and a left one. Make sure the top of the triangle stock is flush with the top of the sub-fin. Repeat for the other side, then set the sub-fins aside.

Wing Construction

NOTE: The wings are built upside down over the plans.

- ☐ ☐ 12. Cut from their sheets wing ribs R1, R2, R3, R4, R5 and R6. (1/16" balsa) Cut a 1/8" balsa square wing spar and secure it to the building board over the plans. Add ribs R1-R6. Cut a 1/8" balsa square wing spar and glue it into the notches in the bottom of the ribs. Add 1/16" shear webs to the aft sides of the top and bottom wing spars. Make sure the grain on shear webs runs vertically. Glue the 1/2" X 3/8" balsa leading edges onto the front of the wing ribs. Repeat for the other side. (Photo 11)

NOTE: If you're going to install the optional ailerons, you should glue the 1/8" birch ply hatch sill into place between ribs R2 and R3 now.

- ☐ ☐ 13. Make up four wing skins using 1/16" balsa sheet.

NOTE: Pay attention to the grain and density of the wood and place the harder wood on the leading edges of the wingskins. The softer wood could "cup" between the ribs. Wood with a stronger grain should help prevent this.

- ☐ ☐ 14. Glue the sheeting to the bottom of the wing. The wing skins were glued to the wings on the prototype using a combination of alphetic resin on the tops of the wing ribs and CA around the outside. Repeat for the other side. Let dry overnight. (Photo 12)

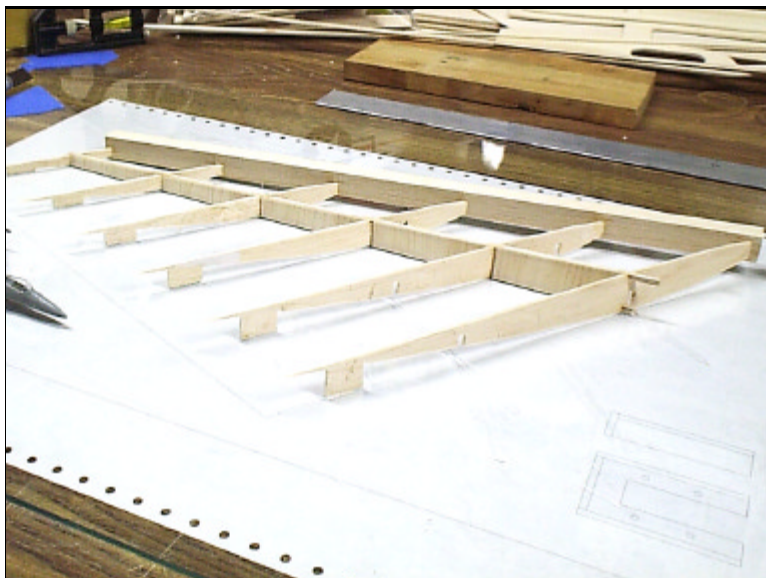


Photo 11



Photo 12

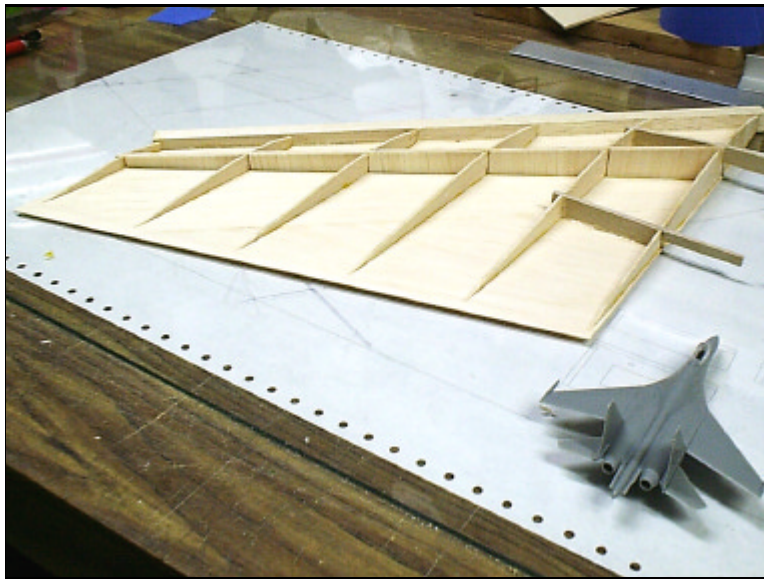


Photo 13

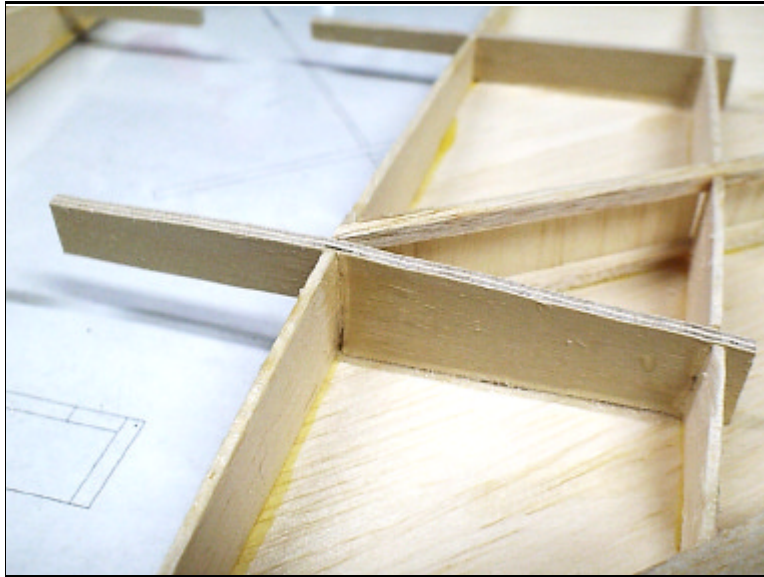


Photo 14

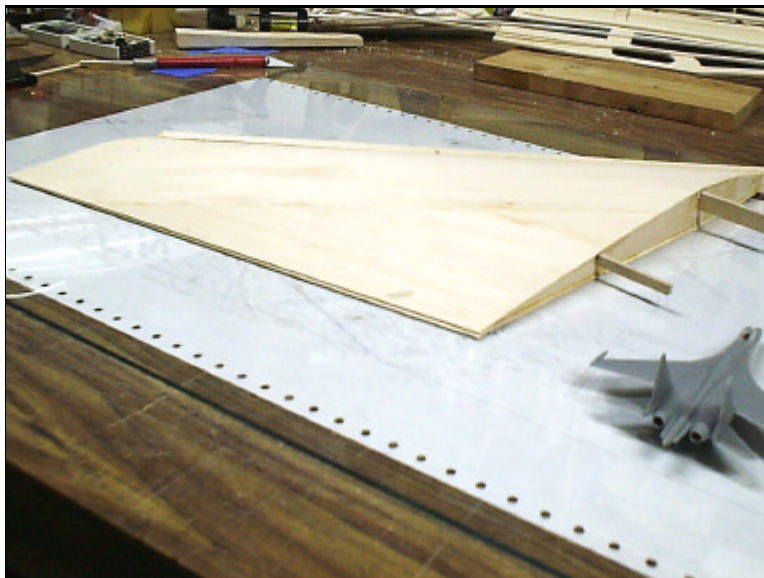


Photo 15

- □ 15. Once the glue has dried, remove the wings from the building board. Cut off the building tabs from the tops of the ribs. Cut from their sheet two FSS and two RSS. (1/8" birch ply) Insert FSS and RSS into the spar slots in the wings. Make sure the bottom of the stubs that stick out from the root rib are parallel with each other. When satisfied, glue the stub spars into the wing. Repeat for the other side. (Photo 13 & 14)

- □ 16. Lay the wings on the building board over the plans. Make sure the wing is straight by adding scrap balsa strip stock under the wing in front of and in back of the bottom spar until the root rib and tip ribs are parallel with each other. Visually check this by sighting down the wing from the tip to the root. When complete, glue the top wing skin into place using the same glues and techniques you used on the bottom wing skins. Repeat for the other side. (Photo 15)



Photo 16

- ☐ ☐ 17. Weight the wing skins using sandwich bag sandbags and let dry overnight. Once dry, remove the wings from the building board and set them aside for now. Repeat for the other side. (Photo 16)

If you are going to add the optional ailerons, you should complete the process at this time. Once the aileron installation is complete, set the wings aside until it is time to mate them to the fuselage.

Lower Fuselage Construction

NOTE: The lower fuselage is built and sheeted upside down over the plans.

- ☐ 18. Cut from their sheets two J1, two J2, two J3, one J4 and one J5. (1/8" lite ply) Secure two J1 and two J2 to the building board over the plans with the slots facing up. (Photo 17)

NOTE: Save the scrap plywood from between J1-J5. These pieces will be needed later during the fan hatch construction.

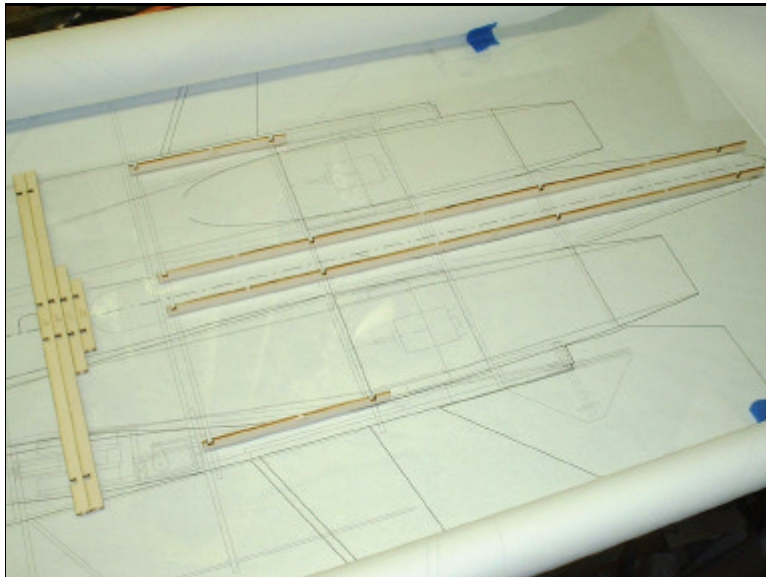


Photo 17

- ☐ 19. Insert and glue two J2, two J3, one J4 and one J5 into the slots in J1. Cut from their sheets one K1, one K2 and one K3 and one K4. Remove K1A from K1. Secure K1 over the plans, etching side facing up. (Photo 18)

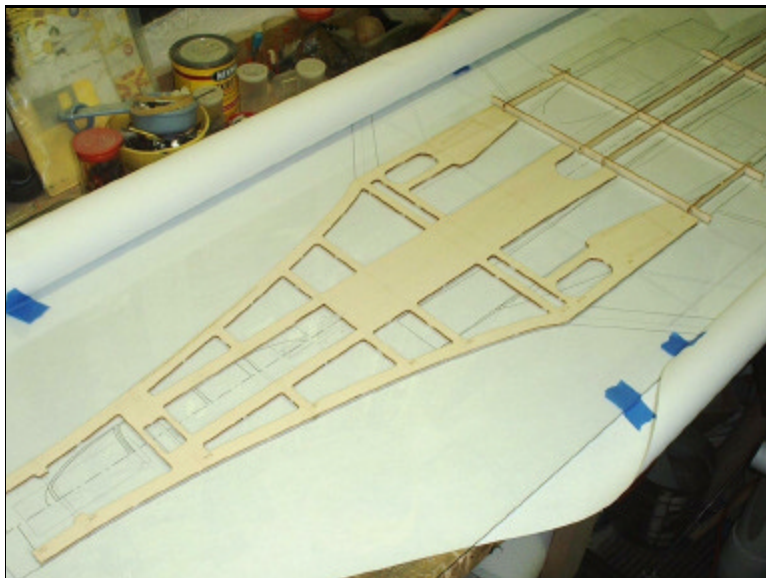


Photo 18

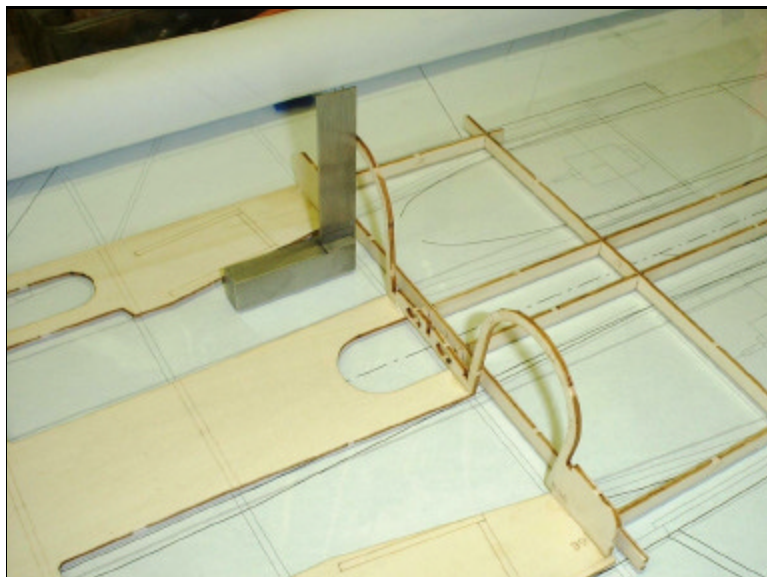


Photo 19

- ☐ 20. Using a square, align and glue B9B onto it's place on K1. Make sure the aft face of B9B is flush with the aft edge of K1. (Photo 19)

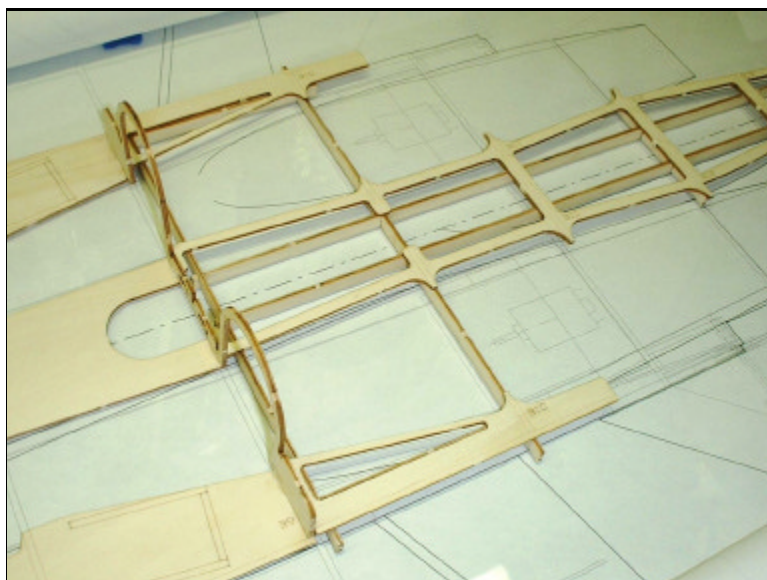


Photo 20

- ☐ 21. Position K2, K3 and K4 onto the jig pieces over the plans. Make sure that the front of K2, K3 and K4 all touch the aft side of B9B. Be careful not to distort B9B by pushing too hard. Lightly tack glue these pieces to the jig pieces on which they rest, then glue these pieces securely to B9B. (Photo 20)

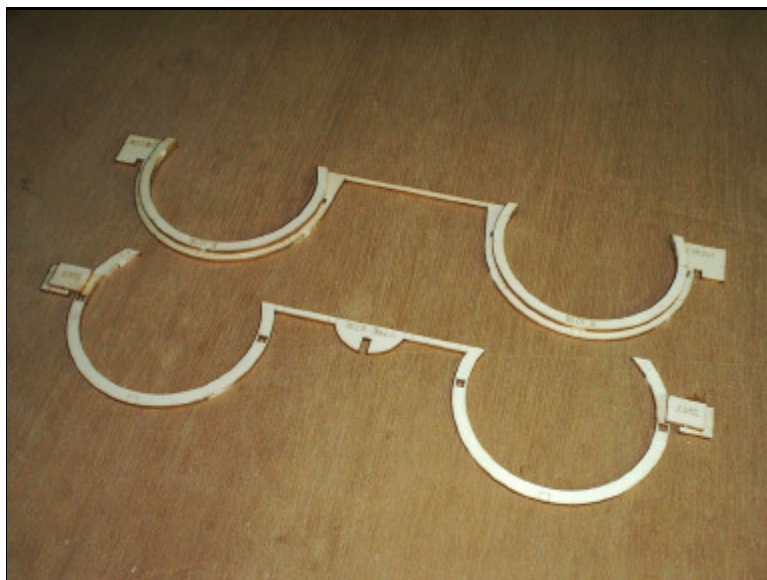


Photo 21

- ☐ 22. Cut from their sheets one B10B, one B11B, two F2 and two EM1. (1/8" lite ply) Glue the two F2 to the front of B10B and the two EM1 to the back side of B11B. (Photo 21)

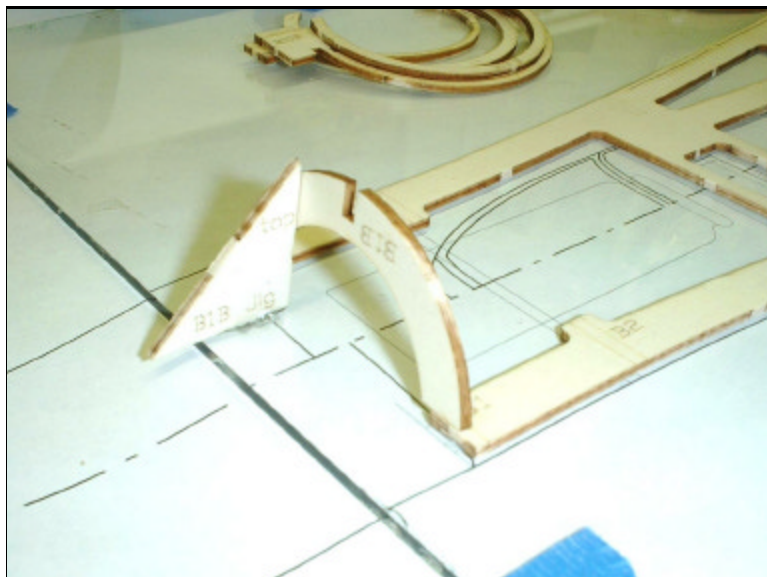


Photo 22

- ☐ 23. Cut from their sheets, one of each of the following; B1B, B2B, B3B, B4B, B5B, B6B, B7B-1, B7B-2, B8B, B12B, B13B, B14B, B1B Jig, K5 and K6. (1/8" lite ply) Position and glue B1B Jig to the building board and B1B to J1. (Photo 22)

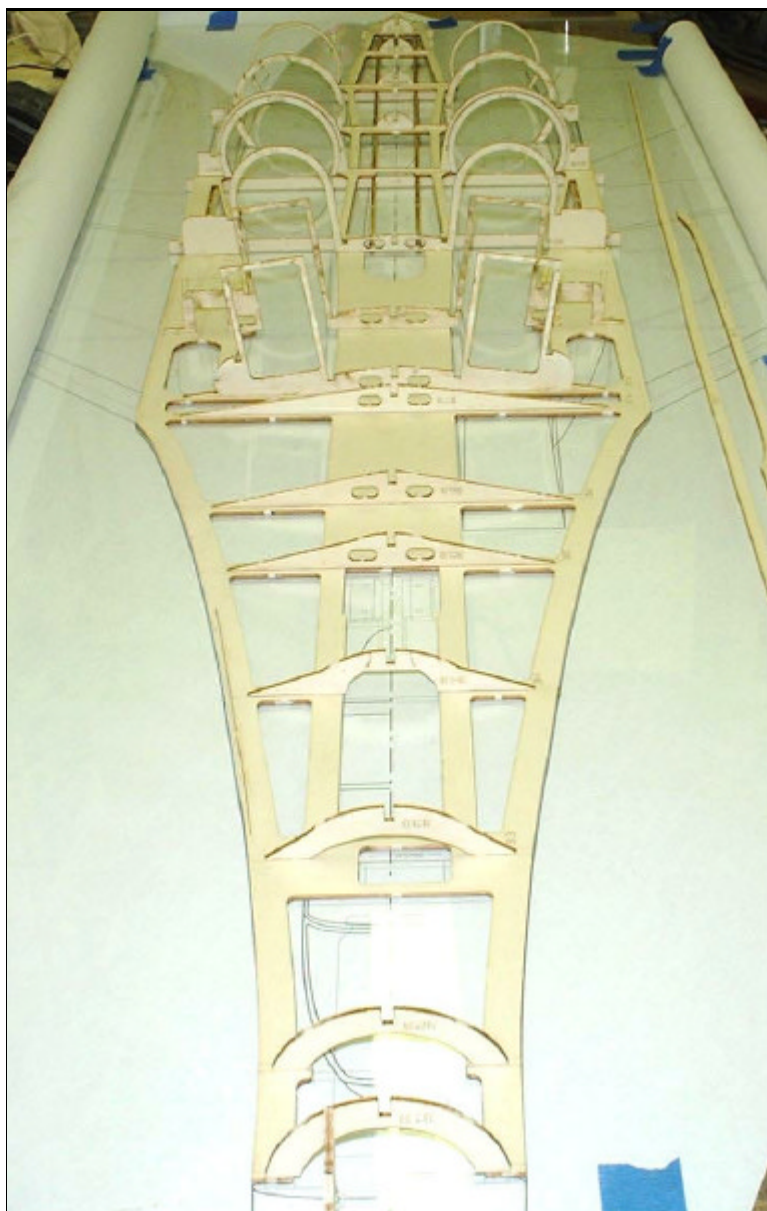


Photo 23

- ☐ 23. Using a square, position and glue B2B, B3B, B4B, B5B, B6B, B7B-1, B7B-2, B8B, B10B, B11B, B12B, B13B and B14B onto K1, K2, K3 and K4. With the exception of B10B and B11B, it doesn't matter which way these bulkheads face. B10B should face with the F2 side forward and B11B should face with the EM1 side aft. (Photo 23)

NOTE: You'll need to secure to the building board the outboard ends of both B11B and B12B.

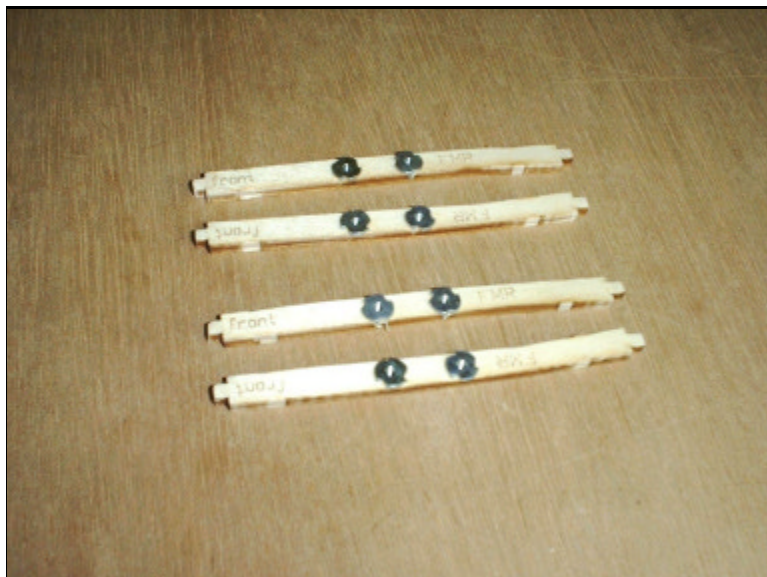


Photo 24

- ☐ 25. Cut from their sheets four FMR. (1/8" birch ply) Install four 2-56 T-nuts (not included) in the holes. Make sure to make up two left rails and two right rails. (Photo 24)

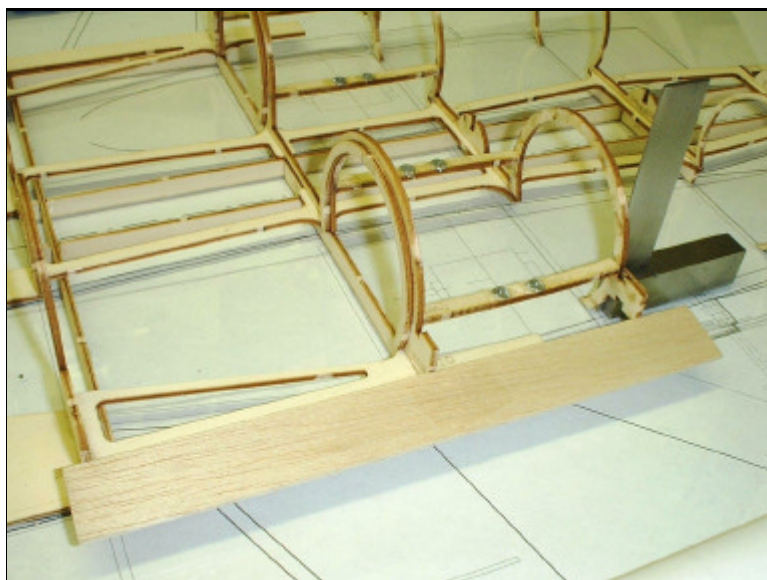


Photo 25

- ☐ 26. Carefully spread B10B and B11B to insert into their mounting holes the four FMR pieces. Make sure that the T-nuts are facing toward the bottom of the model. Use a square to make sure that B11B is straight, then glue FMR to B10B and B11B. (Photo 25)

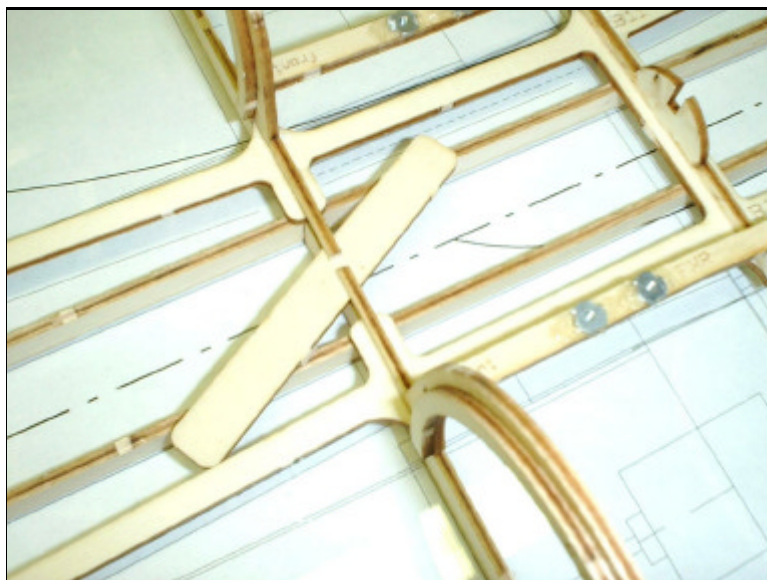


Photo 26

- ☐ 27. Use some 1/8" lite ply sheet scrap that will to act as a cutting board. Rest this piece on the jig pieces under the center of B10B. Using a razor saw, gently cut away the center 1/8" of B10B to clear the center keel. (Photo 26)

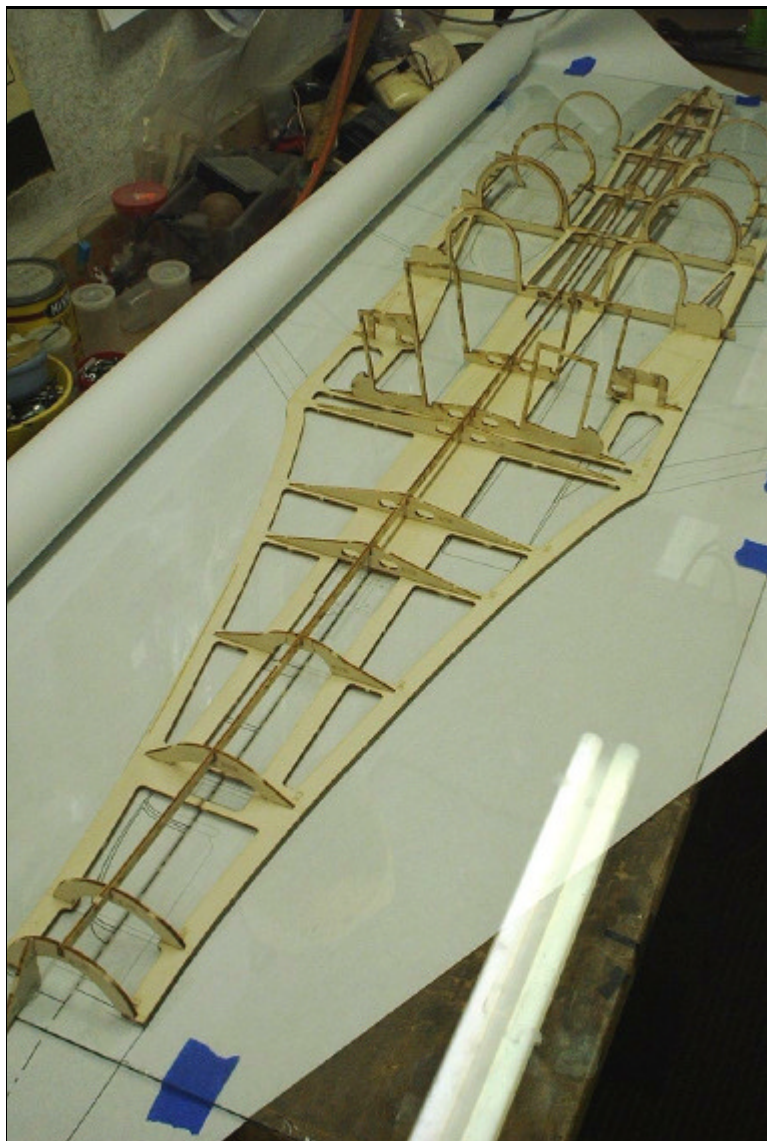


Photo 27

- 28. Insert and glue K6 into the center slots of the bulkheads B10B, B11B, B12B, B13B and B14B. Insert and glue K5 into the center slots of B1B, B2B, B3B, B4B, B5B, B6B, B7B-1, B7B-2, B8B, B9B. Glue the joint between K5 and K6. (Photo 27)

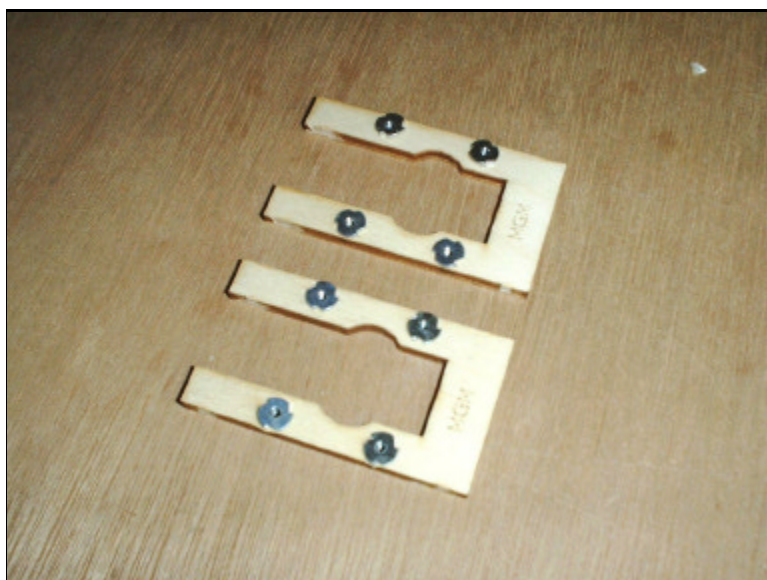


Photo 28

- □ 29. Cut from their sheets two MG1, two MG2, two MG3, two MG4. (1/8" birch ply) Install four T-nuts (not included) in the holes in MG1. Make sure that the T-nuts are facing toward the top of the model. Repeat for the other side. (Photo 28)

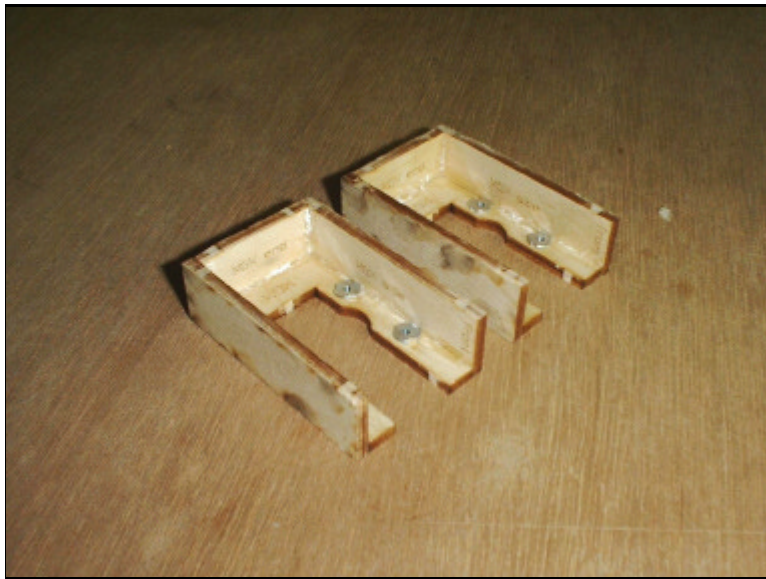


Photo 29

- 30. Using a square, glue MG4 to the aft edge of MG1. Glue MG2 and MG3 to the side edges of MG1 and MG4. Repeat for the other side. (Photo 29)



Photo 30

- 31. Add 1/4" balsa triangle to the inside corners of the main gear mount assembly. Make sure to relieve the triangle stock for the T-nuts. Be careful not to get any glue into the threads. Repeat for the other side. (Photo 30)

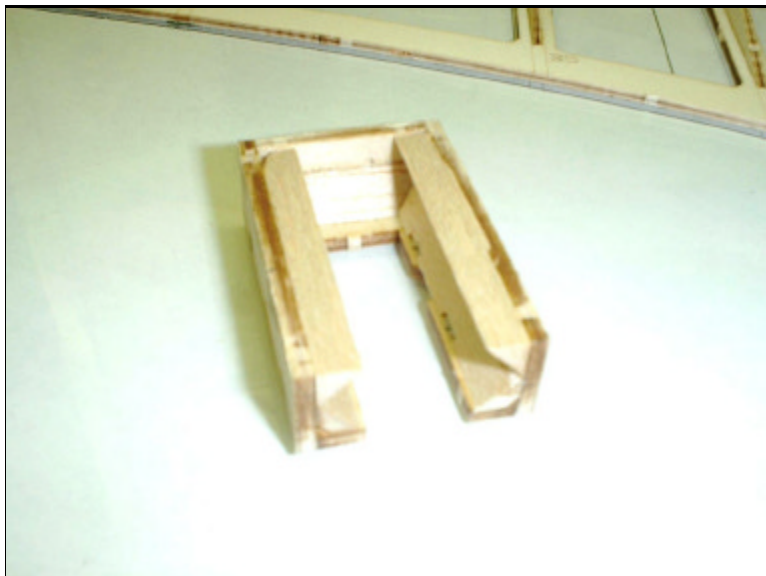


Photo 31

- 32. Add 1/4" balsa triangle to the inside edges of MG2 and MG3. Repeat for the other side. (Photo 31)

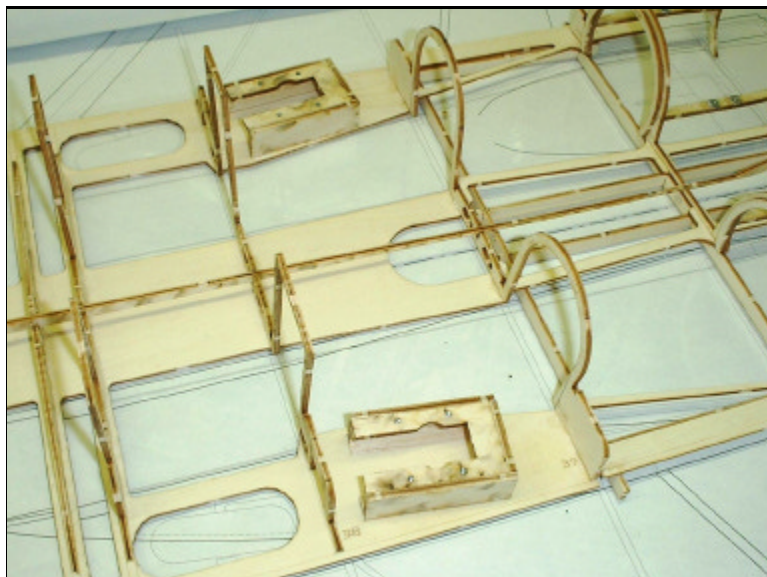


Photo 32

- 33. Position and glue the main gear mount over the etched alignment marks on K1. Repeat for the other side. (Photo 32)



Photo 33

- 34. Cut from their sheet two F5. (3/32" balsa) Glue these to their location on K1. Glue the 1/8" balsa square stringers between B7B-2, B8B, B9B, B10B, B11B and B12B. Glue stringers to the inside corner joints between the two engine nacelles and the inside corner joints between the engine nacelles and the main landing gear fairing or the inside corner joints between the round and flat parts of the aft facing radar boom or the front of B7B-2. Be sure to add stringers along the edge of the aft facing radome. Repeat for the other side. (Photo 33)

NOTE: The flat portion of the radome tapers in thickness between B12B and B14B. The bottom of the radome sides has a flat taper while the top is slightly curved.

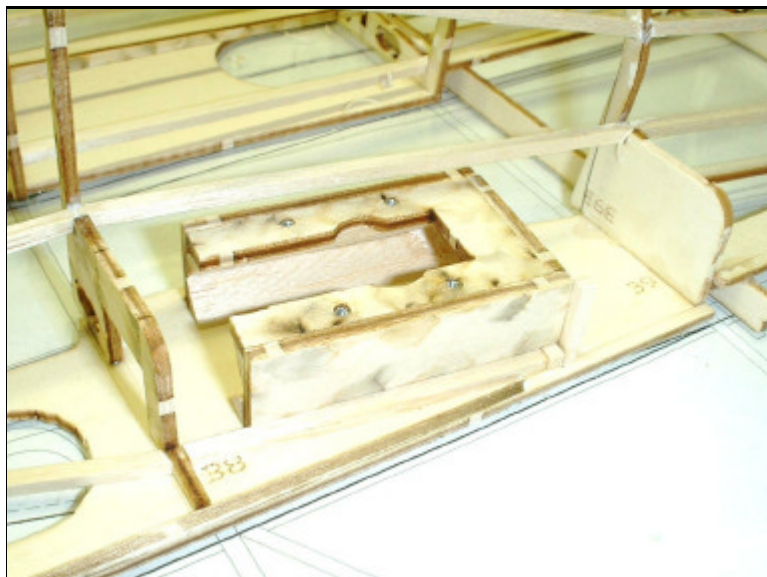


Photo 34

- 35. Glue the 1/8" balsa square vertical filler to the outboard trailing corner of the main gear mount. Glue the 1/8" balsa square stringer around the main gear mount. between B7B-2 and B8B and between B8B and B9B. Repeat for the other side. (Photo 34)

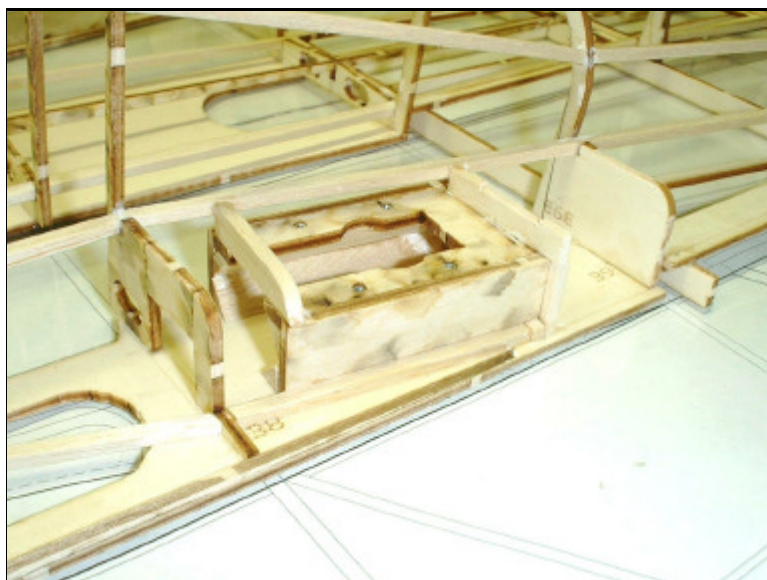


Photo 35

- 36. Cut from their sheets two F3, two F4 (1/8" lite ply) and two SM4. (1/8" birch ply) Position and glue F3 onto aft portion of the main gear mount and F4 onto the front. Repeat for the other side. (Photo 35)

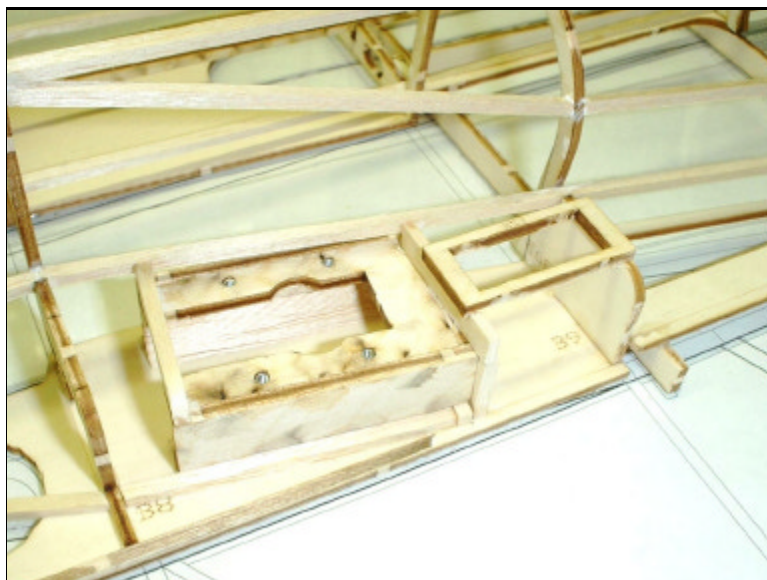


Photo 36

- 37. Glue SM4 into the notches in F3 and B9B. Repeat for the other side. (Photo 36).

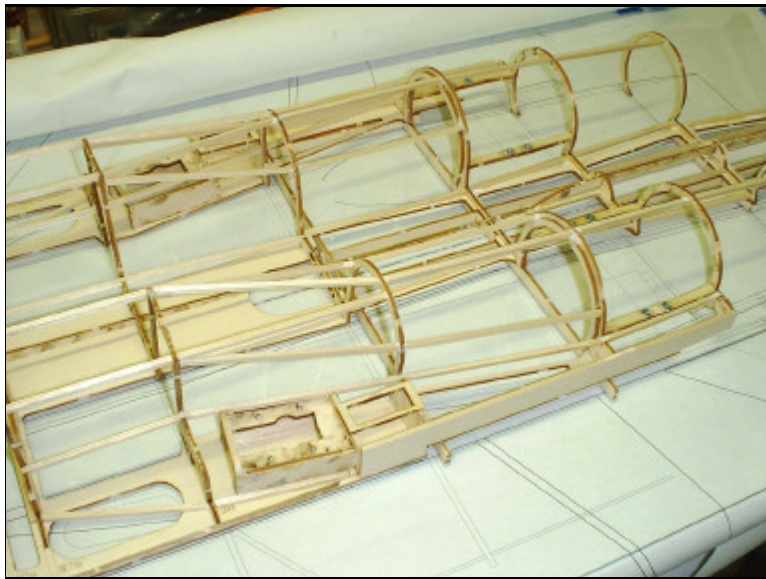


Photo 37

- 38. Cut from their sheet two F6. (1/8" balsa)
Position and glue an F6 to the bottoms of K1 and K3/K4, to the outside of the vertical balsa filler and to the sides of bulkheads B8B, B9B, B10B and B11B. Make sure that the trailing edge of F6 is flush with the back of B11B. Repeat for the other side. (Photo 37)

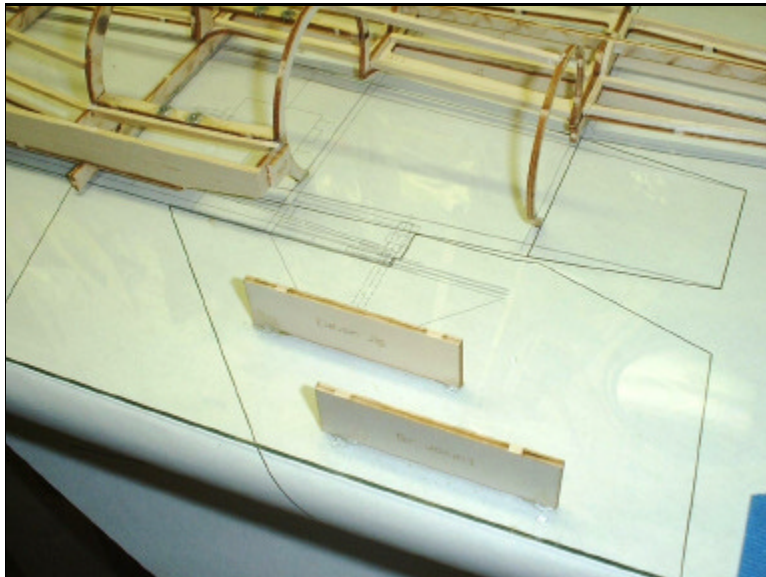


Photo 38

- 39. Cut from their sheet four Elevon Jigs. (1/8" lite ply) Secure these over the plans. Repeat for the other side. (Photo 38)



Photo 39

- 40. If the elevon pivot bearing (7/32" ID tubing) is not in the elvon mount, insert it at this time. Make sure the inboard end of the tube is flush with the inboard face of EM4. Slip the elevon mount over the elevon pivot rod and rest the elevon on the elevon jigs. Make sure the elevon mount fits snugly over EM1 on the back of B11B. Repeat for the other side. (Photo 39)

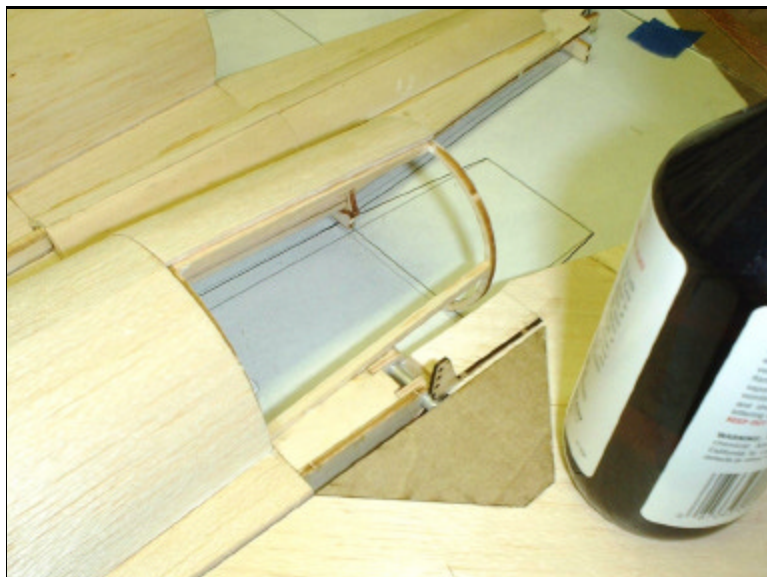


Photo 40

- 41. Mix up some medium- to fast-set epoxy and apply it around the outside edge of EM1 and the inside of the elevon mount that mates with EM1. Slip the elevon mount over EM1 with the elevon resting on the elevon jigs. Place a moderately heavy weight (12 oz. liquid) on the elevon to keep it from shifting while the epoxy dries. Glue the elevon pivot bearing to the inside of the elevon mount. Once the glue has dried, remove the elevon and set it aside. If possible, leave the elevon jigs in place until after the lower fuselage is complete. Cut from their sheet two EM7. (1/64" birch ply) Wrap and glue EM7 in the notch around the back of the elevon mount. Repeat for the other side. (Photo 40)

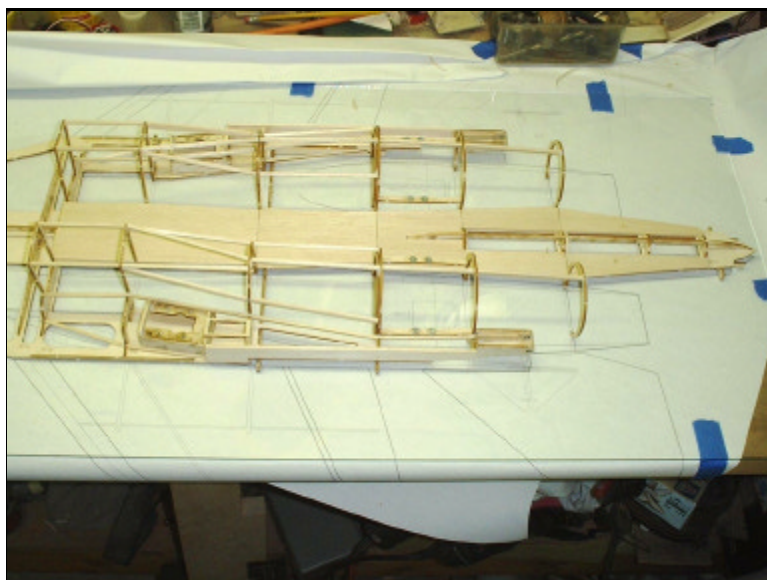


Photo 41

- 42. Using the supplied 3/32" balsa, sheet the flat area of the fuselage between the engine nacelles and B10B and B14B. Cut from it's sheet NS1. (3/32" balsa) Use this to sheet the area between B9B and B10B. Make sure to face the etched side down so it will be visible from the top. Also, make sure that the scoop is oriented with the big end facing forward so it draws hot air out of the fuselage. Finish sheeting the areas between the engine nacelles and B7B-2 and B9B. (Photo 41)

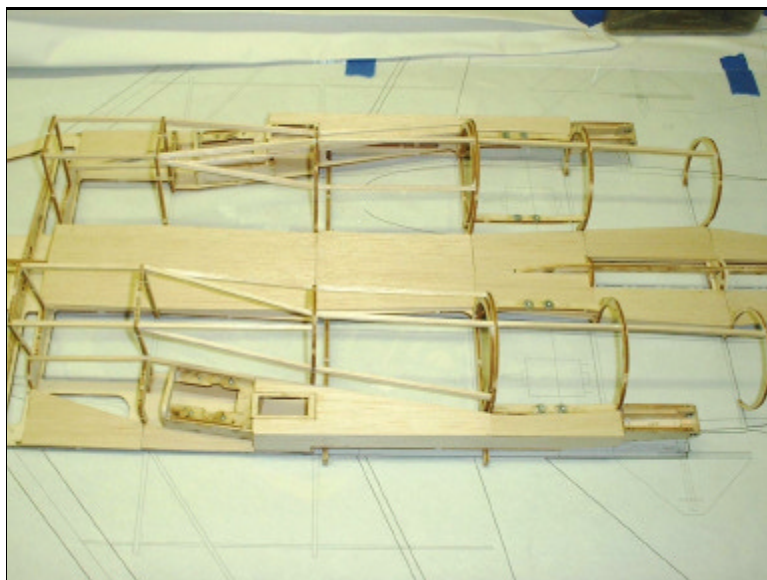


Photo 42

- 43. Using 3/32" balsa, sheet the flat area outboard of the main gear fairing between B7B-1 and the outboard aft corner of the main gear mount. Sheet the flat area on the bottom of the main gear mount between F3 and B11B. Repeat for the other side. (Photo 42)

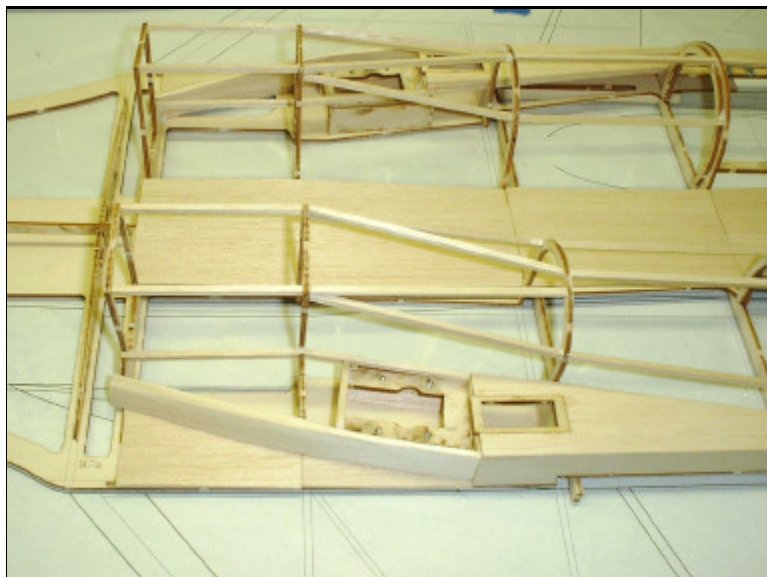


Photo 43

- 44. Using 3/32" balsa, sheet the vertical half of the front of the main gear fairing between B7B-2 and the outboard aft corner of the main gear mount. Lightly sand a taper along the edge from back to front so the sheeting fairs smoothly. Repeat for the other side. (Photo 43)

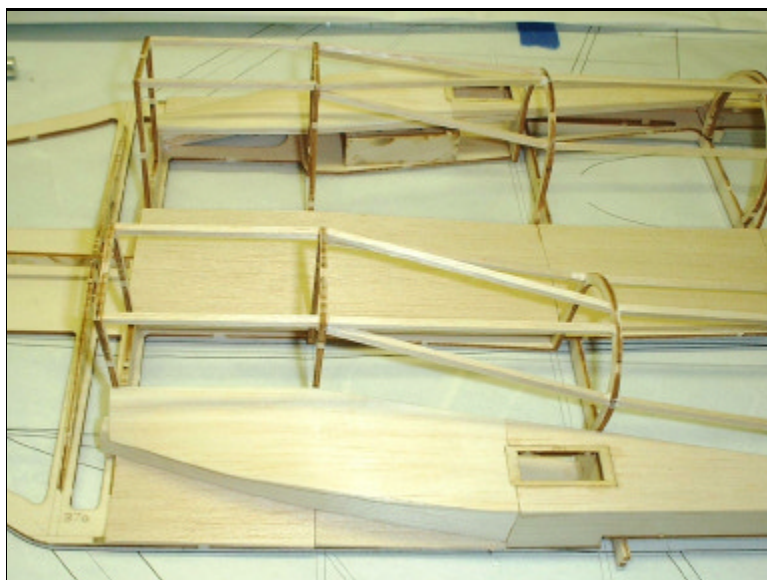


Photo 44

- 45. Using 3/32" balsa, sheet the flat half of the front of the main gear fairing between B7B-1 and F3. Repeat for the other side. (Photo 44)

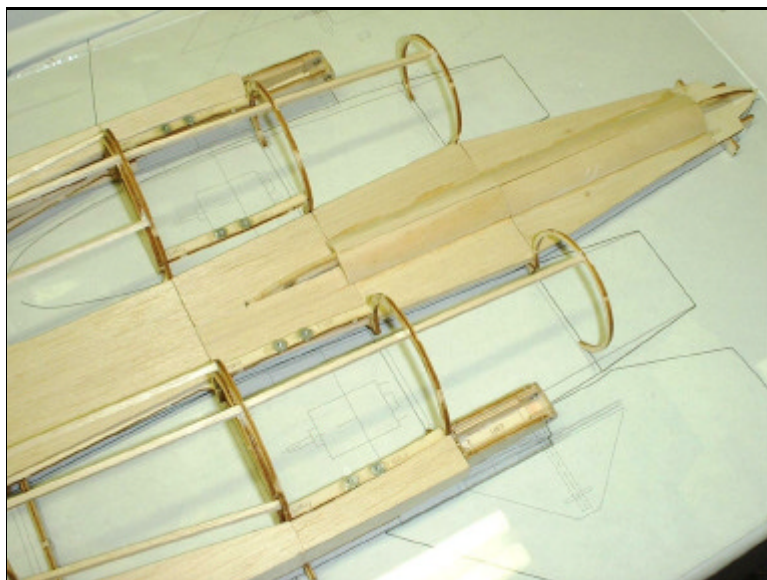


Photo 45

- 46. Using 3/32" balsa, sheet the round portion of the aft facing radome between B11B and B14B. (Photo 45)

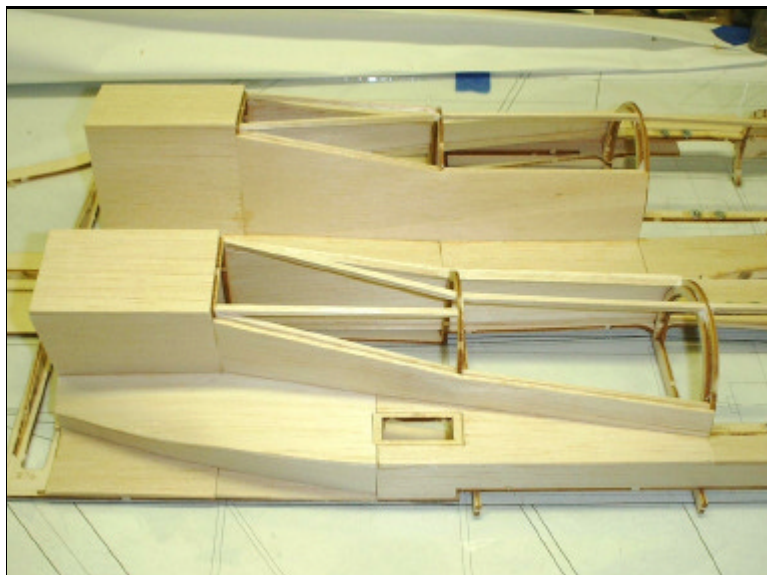


Photo 46

- 47. Working from front to back, use 3/32" balsa to sheet the sides of the engine nacelles between B7B-2 and B8B. Next, sheet the tops of the nacelles in this area. Sheet the areas between B8B and B9B. Make sure to make these sections out of one piece each so that they help reinforce the fuselage keel joint in this area. Repeat for the other side. (Photo 46)

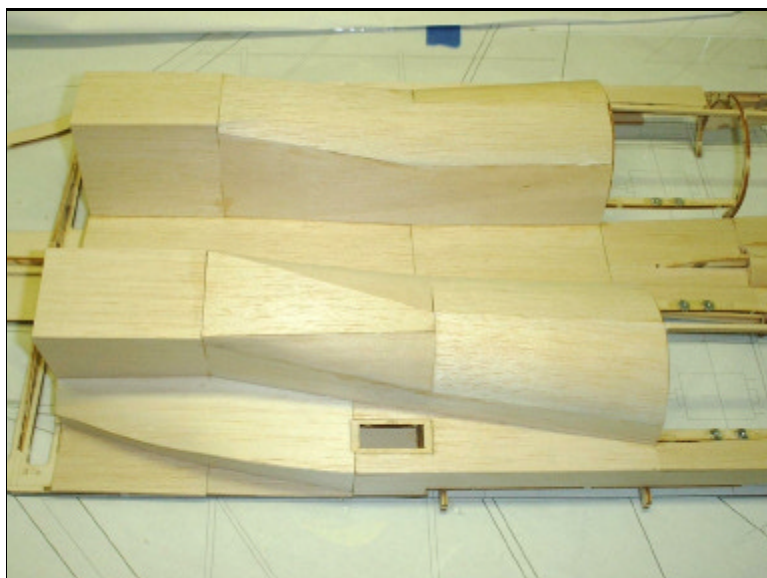


Photo 47

- 48. Using 3/32" balsa, finish sheeting this area. It will be easier to bend the wood if you first wet the outside of the wood. Don't try to bend the wood immediately. Instead, let the water soak into the wood and soften it. Applying water to only one side of the sheeting will cause it to swell and will aid in the bending of the wood to the desired shape. Repeat for the other side. (Photo 47)



Photo 48

- 49. Using 3/32" balsa, sheet the engine nacelles between B9B and B10B. Repeat for the other side. (Photo 48)

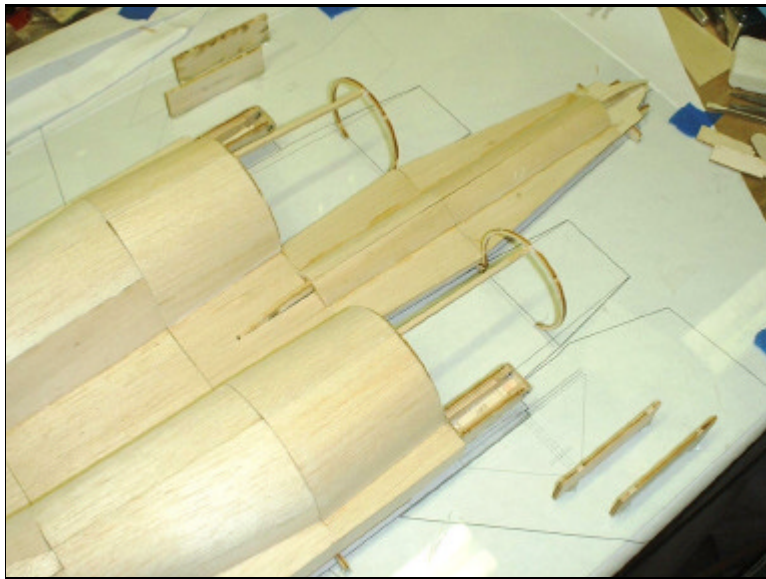


Photo 49

- 50. If you previously removed the elevon jigs, secure them once again to the building board. Repeat for the other side. (Photo 49)



Photo 50

- 51. Slip the elevon pivots into the pivot bearings and rest the elevon on the jigs. Place a moderately heavy weight (12oz. liquid) on the elevon to keep it in contact with the jigs. Repeat for the other side. (Photo 50)



Photo 51

- 52. Using 1/8" balsa square, add a stringer along the top of the elevon mount between B11B and B12B. Sheet the inside of the engine nacelle between B11B and B12B. Repeat for the other side. (Photo 51)



Photo 52

- ☐ ☐ 53. Finish sheeting the nacelles between B11B and B12B. Make sure to carry the sheeting all the way to the edge of the stringer you just added. Repeat for the other side. (Photo 52)

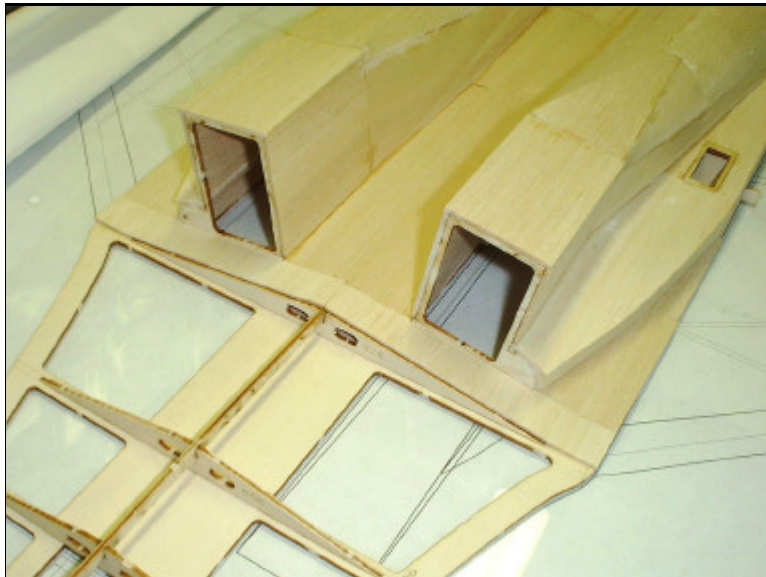


Photo 53

- ☐ 54. Using 3/32" balsa, sheet the flat areas between B7B-1 and B7B-2. (Photo 53)



Photo 54

- ☐ 55. For sheeting the next area, the edges need to be tapered so they meet smoothly with the edge of the fuselage. You must taper the inside. Be aware that the amount of taper will vary from one fuselage station to the next. (Photo 54)

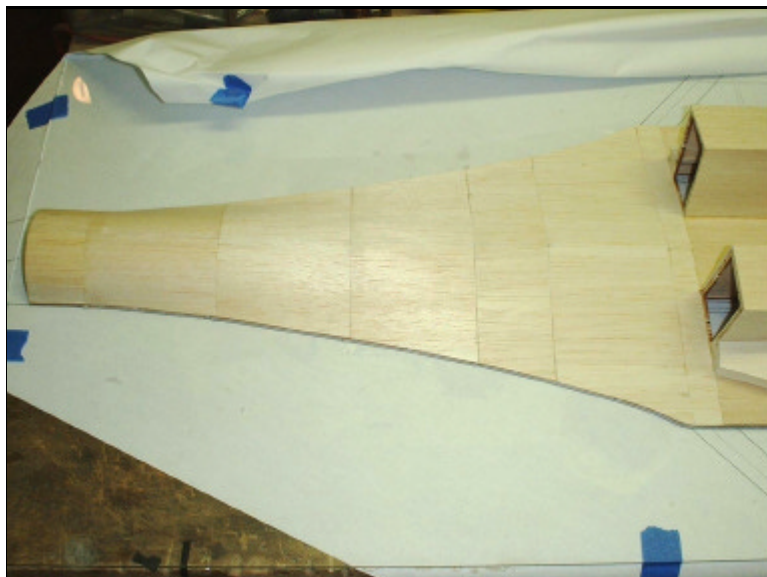


Photo 55

- ☐ 56. Using 3/32" balsa, finish sheeting the rest of the underside of the forward fuselage. (Photo 55)



Photo 56

- ☐ ☐ 57. Cut from their sheet four F7 (1/8" balsa) and eight F8. (1/4" balsa) Glue two sets of F8 to each other to form a 1/2" thick laminated filler block. Repeat for the other side. (Photo 56)

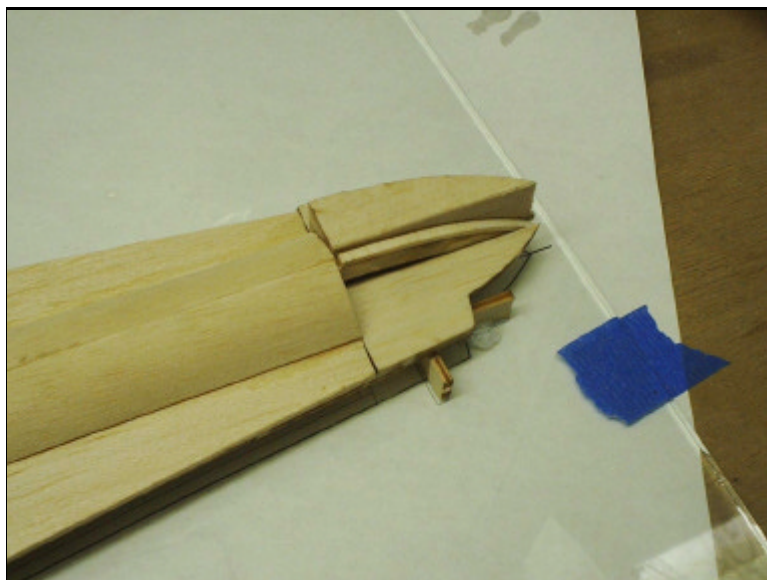


Photo 57

- ☐ 58. Place an F7 on either side of K6 and glue to K2. Then place and glue an F8 laminated block on either side of K6 and onto F7. (Photo 57)

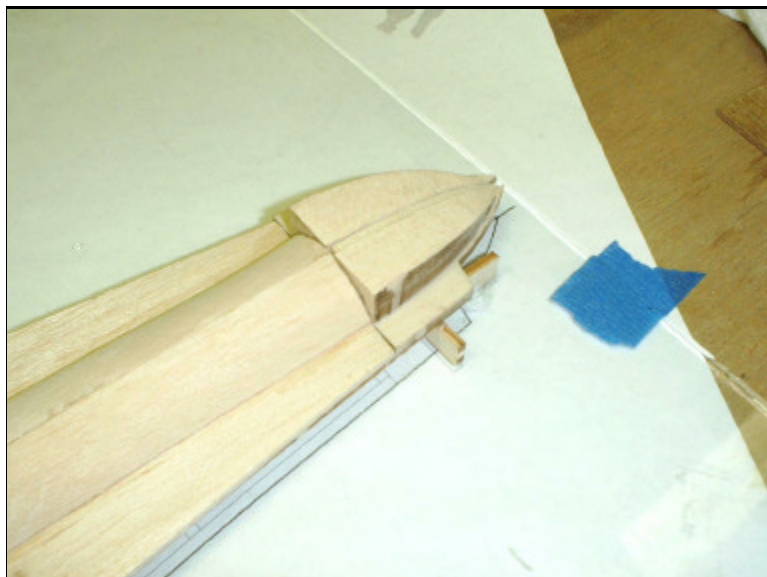


Photo 58

- ☐ 59. Use a razor plane and sanding block to shape the F8 filler pieces to match the profile of the tailcone of the aft radome. Do not round the filler blocks any more than this right now as it would be better to wait until the top is done. (Photo 58)



Photo 59

- ☐ 60. Repeat the process for the front nose cone of the aft radome. (Photo 59)

Note: Once the glue has dried, the lower fuselage is ready to be pulled off the building board. The rest of the fuselage construction is done with the fuselage free of the building board.

Upper Fuselage Construction

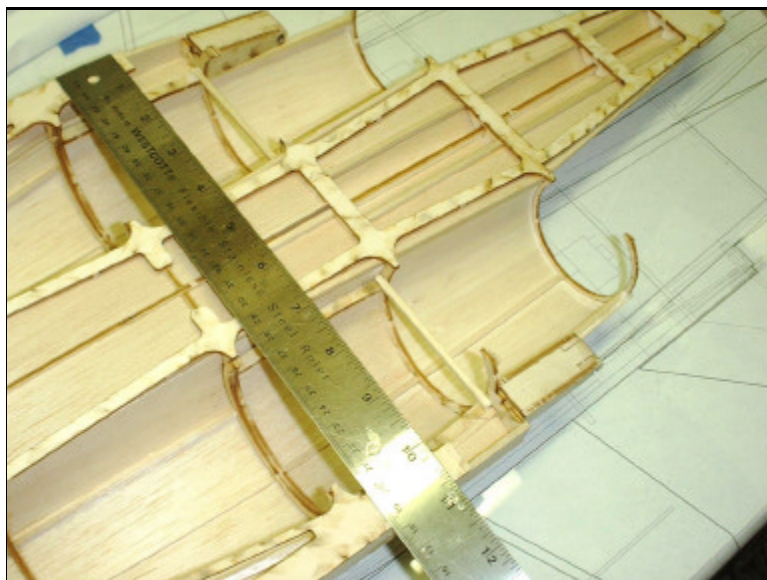


Photo 60

- ☐ ☐ 61. Measure the distance between K6 and the outboard edges of F6 at bulkhead B10B. Measure both sides of the fuselage. Measure again at B7B-1 and note the difference. If the fuselage is wider at B10B than B7B-1, then it's possible that the bottom half of the nacelles are spreading. If so, then cut a couple of pieces of scrap 1/8" balsa squares and tack glue them to the top of the inboard FMR. Squeeze the fuselage together while measuring and tack glue the 1/8" balsa square to the top of the outboard FMR. This will help keep the fuselage from being distorted while you build the upper half. Repeat for the other side. (Photo 60)

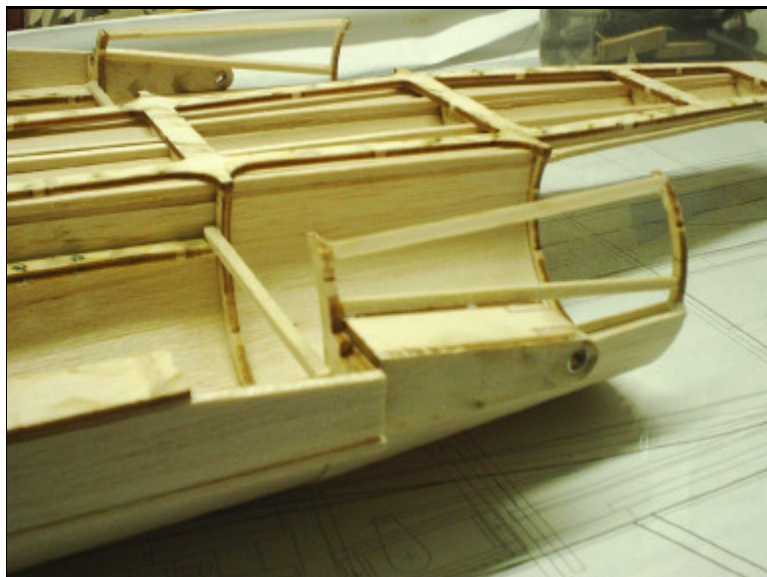


Photo 61

- 62. Glue two 1/8" balsa square stringers between B11B and B12B. Make sure that both stringers are set so the outer edge is flush with outside edge of both bulkheads. Make sure the lower stringer is resting against the top of the elevator mount. Repeat for the other side. (Photo 61)

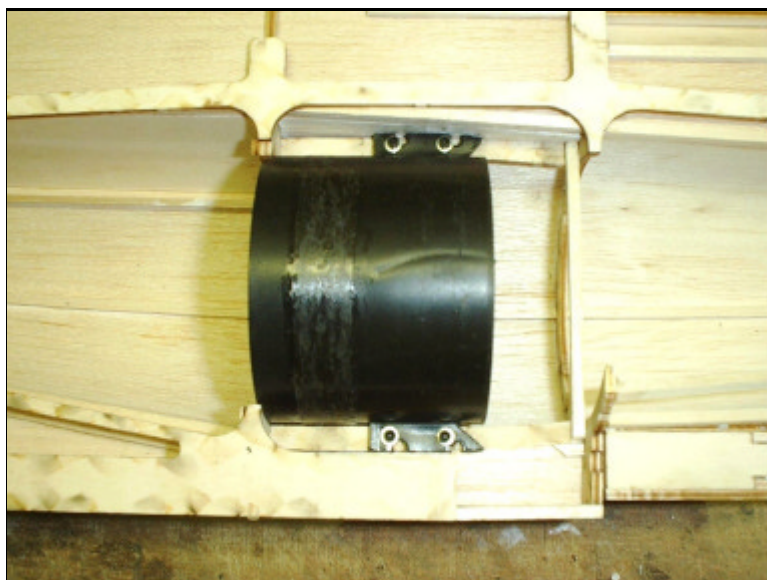


Photo 62

- 63. Remove the excess mounting flange from both fan units and test fit them into the fuselage. Trim as required so they don't distort themselves or the fuselage when the mounting screws are tightened. Cut a small 1/4" notch in the aft end of the mounting flanges so the tailpipe can be slipped over the fan unit. Repeat for the other side. (Photo 62)



Photo 63

- 64. Carefully sand the aft edges of the inlet liners and check them to make sure they form a tight joint to the front of the fan unit. (Photo 63)



Photo 64

- 65. When satisfied with the fit, remove the inlet liners from the fuselage. Scuff the last 1/2" of the outside of the inlet liner. Mark and scuff the sides of the inlet liner where they contact the fuselage bulkheads. Scuff the forward portion of the inlet liners where they mate with B7B-2. Cut from their sheet two F1 and one B10T. Glue F1 to the front of B10T. Position and glue B10T to the top of K2 and K4. Take care so that you don't accidentally glue the fan unit to the fuselage. (Photo 64)

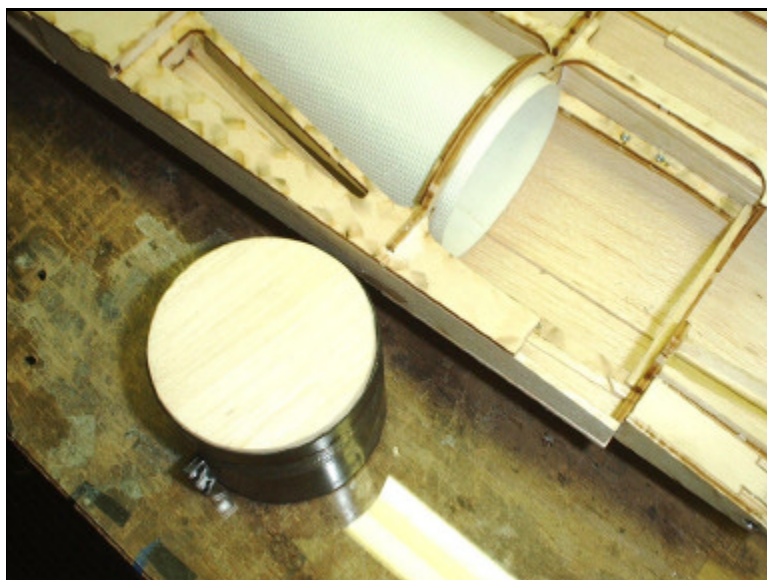


Photo 65

- 66. Remove the fan units from the fuselage. Cut from their sheets one FAT1 and one FAT2 (1/8" light ply) Align and glue FAT1 over FAT2 to build the fan/inlet alignment tool. (FAT) Insert the FAT into the front of the fan unit. Insert the inlet liner into the fuselage and slide it aft through the hole in B10. (Photo 65)

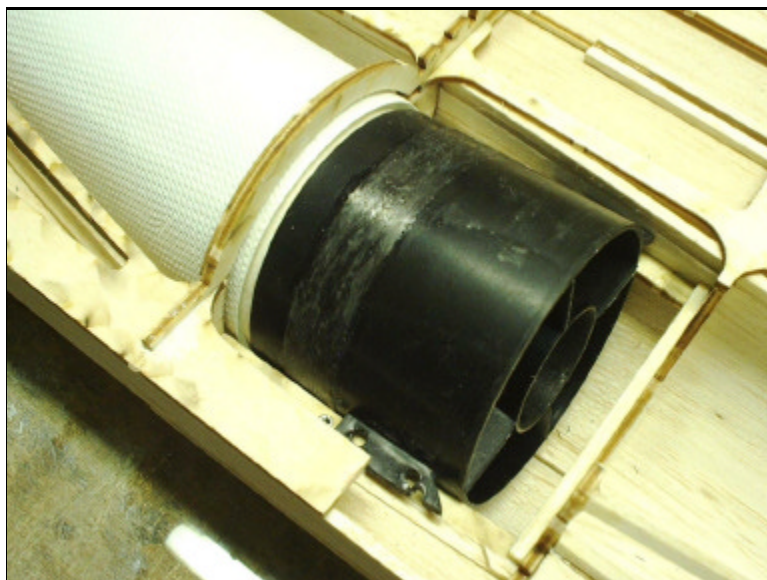


Photo 66

- 67. Carefully mate the fan unit and inlet liner using the FAT. Slide the fan/inlet forward through B10 until the mounting holes in the fan unit flanges are aligned over the mounting holes in FMR. (Photo 66)

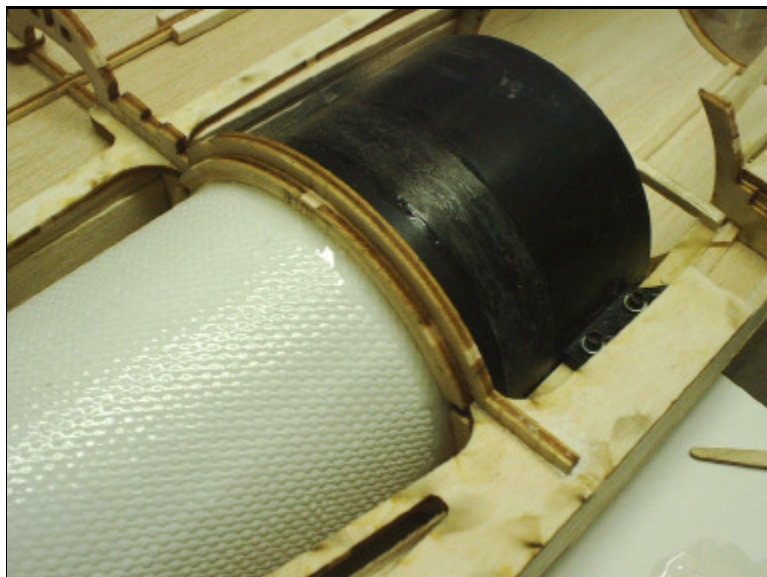


Photo 67

- 68. Carefully bolt the fan unit into the fuselage. Take care so that the inlet liner and fan unit remains tightly mated. Tack glue the top of the inlet liner to the front of B10. Carefully tack glue the front of the inlet liner where it joins B7B-2. (Photo 67)



Photo 68

- 69. Remove the fan unit from the fuselage. Insert the FAT into the inlet liner to keep it from distorting. Make sure it's pushed in far enough so that it is completely clear of the joint between the inlet liner and B10. Mix up some quick-set epoxy. Using the epoxy, carefully build up a glue fillet between the inlet liner and B10. Repeat the process on the front side of B10. When the glue has dried, remove the FAT from the inside of the inlet liner. Mix another batch of epoxy and apply it sparingly to the inlet liner where it contacts B9B, B8B and B7B-2. Repeat Steps 64-69 for the other side. (Photo 68)



Photo 69

- 70. Glue the battery sub-floor K1A into the hole in K1 and to bulkheads B7B-1, B7B-2 and B8B. Cut from their sheets the NACA scoop parts. Two NS2 and one NS3. Glue the two NS2 side pieces to the top of the NS1. After the glue is dry, glue NS3 to the top edges of the two NS2 sides. (Photo 69)

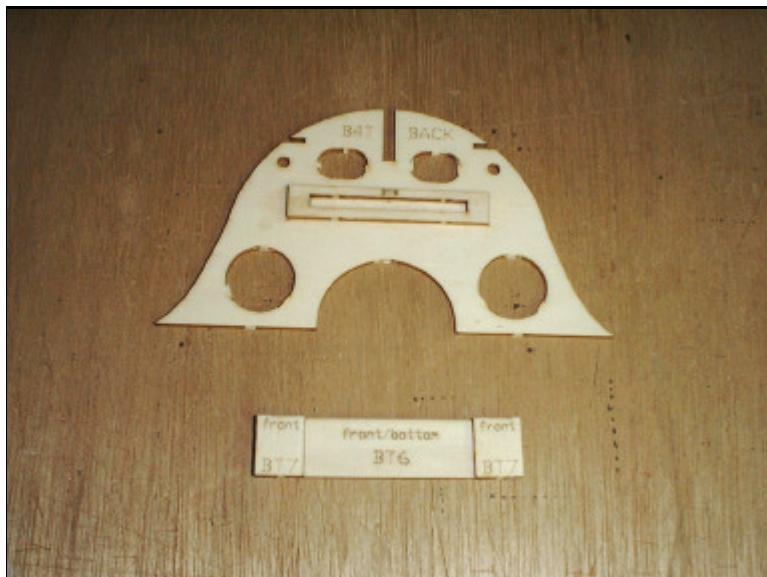


Photo 70

- ☐ 71. Cut from their sheets one B4T, one BT6, two BT7 and one BT8 (1/8" lite ply) Align and glue BT8 to the aft face of B4T. Glue the two BT7 to the bottom of BT6. (Photo 70)



Photo 71

- ☐ 72. Tack glue one of the Elevon Jigs to the front of B1B. (Photo 71)

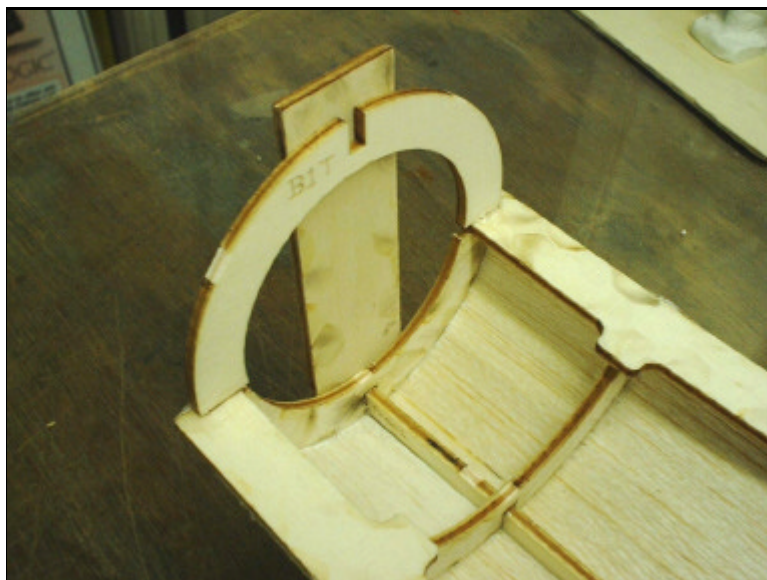


Photo 72

- ☐ 73. Cut from it's sheet one B1T. (1/8" lite ply) Position B1T on the top of K1 and align it to B1B. Make sure B1T is lightly touching the elevon jig. When satisfied, glue B1T to the top of K1. (Photo 72)

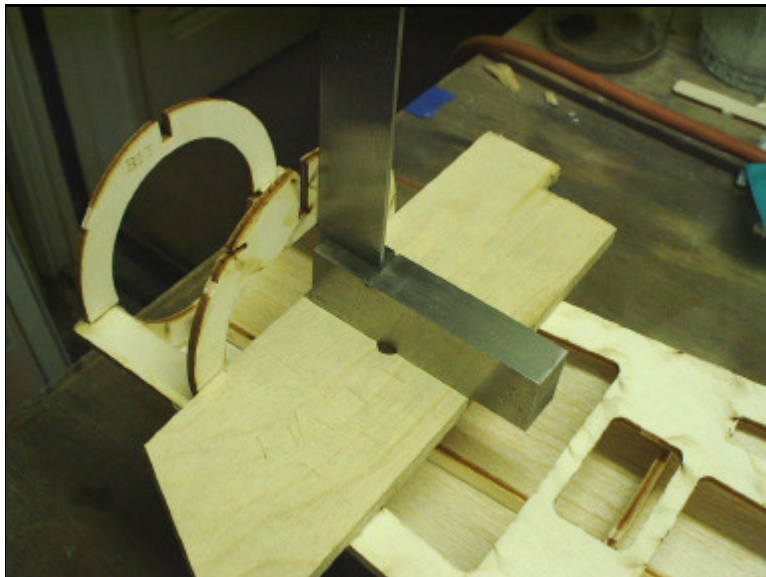


Photo 73

- ☐ 74. Remove the elevon jig from B1B. Cut from it's sheet one B2T. (1/8" lite ply) Using a scrap piece of 1/4" marine ply and a square, align and glue B2T to the top of K1. (Photo 73)

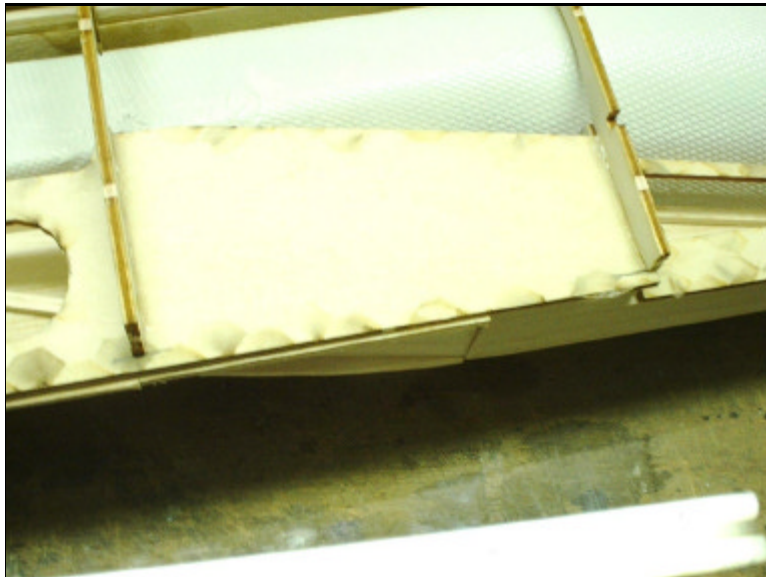


Photo 74

- ☐ 75. Measure and place pencil alignment marks 3/32" inboard from the outboard edge of K1 at the location of B7T, B8T and B9T. (Photo 74)



Photo 75

- ☐ 76. Cut from their sheets, bulkheads B3T, B5T, B6T, B7T, B8T, B9T, B11T, B13T and B14T. (1/8" lite ply) Center, align and square each bulkhead then glue each one to the keel piece on which it's resting. Make sure that B7T is glued over B7B-1. Also make sure that B7T, B8T and B9T all touch the pencil lines you drew in Step 75. (Photo 75)

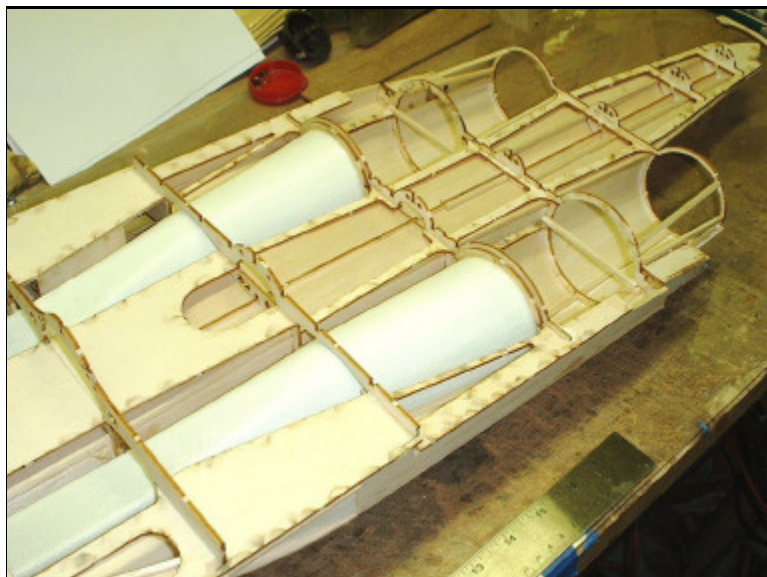


Photo 76

- ☐ 77. Continue gluing bulkheads to the keels until all bulkheads are glued. (Photo 76)

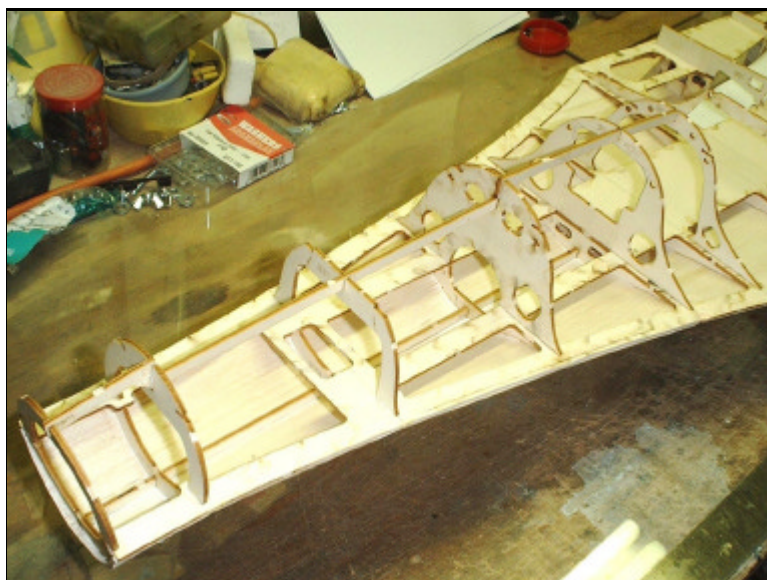


Photo 77

- ☐ 78. Cut from their sheets one K7, one K8. Insert and glue keel K7 into the center slots of B1T, B2T, B3T, B4T, B5T and B6T. (Photo 77)

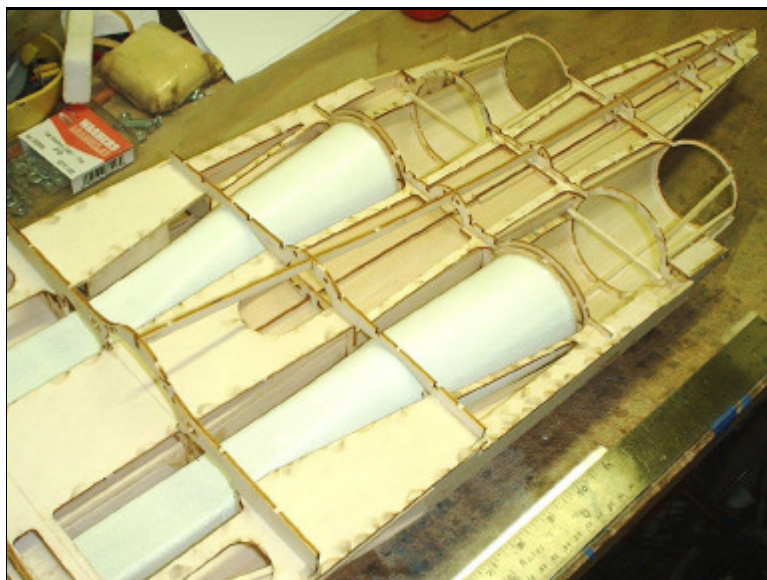


Photo 78

- ☐ 79. Insert and glue keel K8 into the center slots of B8T, B9T, B10T, B11T, B12T, B13T and B14T. (Photo 78)



Photo 79

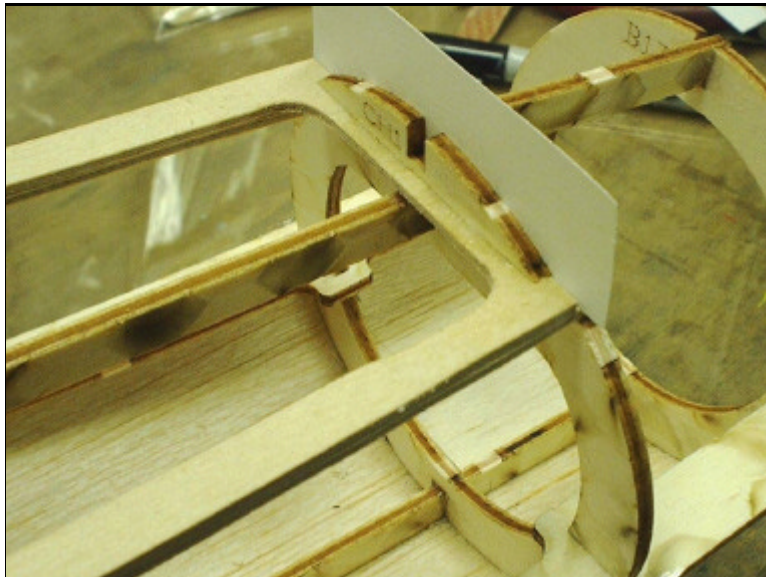


Photo 80



Photo 81

- ☐ 80. Cut from their sheets one CHK, one CH1, one CH2, one CH3, (1/8" lite ply) one CHB and two CHR. (1/16" birch ply) Locate from the supplied hardware bag four 1/4" X 1/16" and four 1/4" X 1/8" hatch magnets. Working over sandwich wrap or wax paper, press and glue each of the 1/4" X 1/16" magnets into the 1/4" holes in CHB. Take care that the bottom of the magnets are flush with the bottom of CHB. Use thin CA (or equivalent) to glue the magnets to CHB. Make sure the 1/4" X 1/8" magnets are magnetically aligned with the magnets in CHB, then press and glue these into the 1/4" holes in each CHR. Make sure the top of the magnet is flush with the top of CHR. Insert, but do not glue each CHR into the slots in B2T and B4T. Cut two 1/2" lengths from the supplied 1/8" hardwood dowel and glue these into the alignment pin holes in CHB. Rest CHB onto the two CHR. Slide each CHR around in their slots until the magnets in CHB/CHR are aligned with each other, then slide the whole assembly around inside the bulkhead slots until the entire assembly is centered over the cockpit area. Tack glue the CHR to the front of B2T and the back of B4T. (Photo 79)
- ☐ 81. Align and center CH1 on CHB and B2T. Place a piece of index card or scrap 1/64" birch ply between CH1 and B2T. Tack glue CH1 to CHB. Be careful not to glue the spacer to CH1, or B2T. (Photo 80)
- ☐ 82. Do the same for the aft cockpit hatch former CH3 and B4T. Once the glue has dried, remove both spacers. (Photo 81)

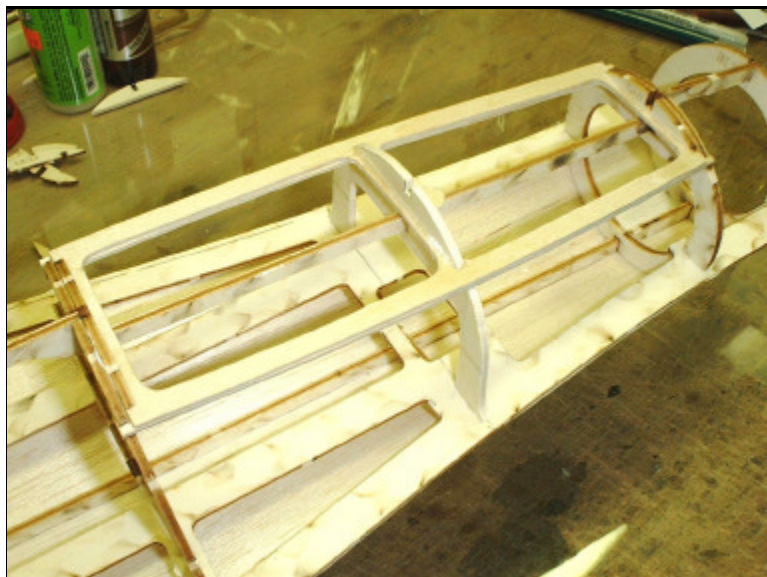


Photo 82

- ☐ 83. Align, center and glue CH2 to CHB. (Photo 82)



Photo 83

- ☐ 84. Insert and glue CHK into the center slots of CH1, CH2 and CH3. (Photo 83)



Photo 84

- ☐ 85. Carefully sand the outboard edges of CHB and CHR to match the shape of the fuselage. (Photo 84)

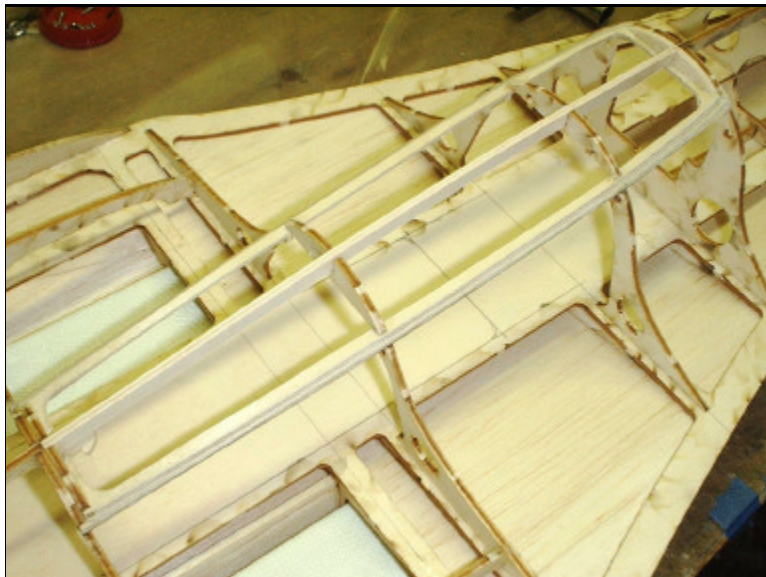


Photo 85

- 86. Cut from their sheets one BC1, one BC2, one BC3, one BC4 and one BCK, (1/8" lite ply) one BCB and two BCR. (1/16" birch ply) Repeat steps 80 through 85 for the battery compartment hatch. Once the glue is dry, remove both hatches from the fuselage and set them aside. (Photo 85)

NOTE: The primary difference in construction between the battery compartment hatch and the cockpit hatch is that there are only two pairs of magnetic latches instead of four and the alignment pins go into the 1/8" holes in BC4/B8T instead of the CHB/CHR.



Photo 86

- 87. Cut from their sheets two F10, two F11, (3/32" balsa) two F12 (3/16" balsa) and two F13. (1/8" balsa) Align and glue F10 to the outside edge of K1 and B8T. Make sure the trailing edge of F10 is flush with the back of B8T. Align and glue F11 to the outside edge of K1 and B9T. Make sure that there is a 1/8" gap between the back of B8T and the front of F11. Align and glue F12 to the outside edge of K3/K4. Make sure that the bottom front of K12 is touching the back of B9T. Align and glue F13 to the inside edge of F12. Make sure F13 is parallel to the outside edge of K3/K4. To keep F11 from breaking off during handling, glue some 1/4" balsa triangle stock to the inboard face of F11 and to the top of K1. (Photo 86)

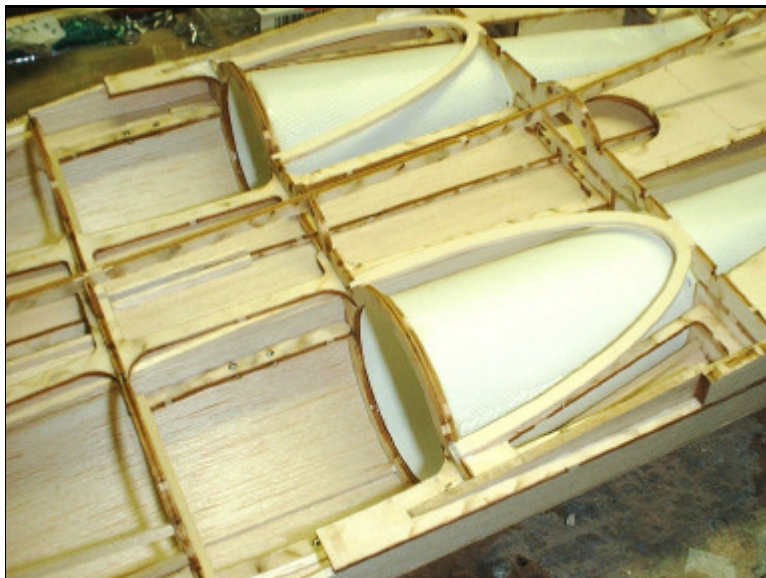


Photo 87

- 88. Cut from their sheet two F14. (1/8" lite ply) Insert F14 into the notches in B9T and B10T. Note that only the inboard side of F14 has a tab. The aft end of F14 glues to the front of B10T. Repeat for the other side. (Photo 87)

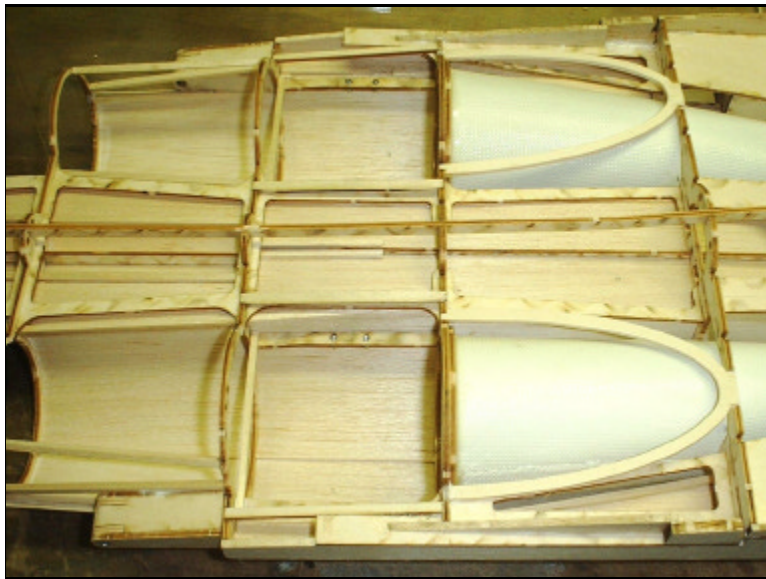


Photo 88

- 89. Cut from their sheets two F15, two F16, (1/8" lite ply) and two F17. (1/16" birch ply) Align and glue F15 onto the mounting tab of K2 at the forward inboard corner of the fan compartment. Glue F16 into the notches in B10T and B11T. Align F17 into the notch in K3/K4 and to the back to B10T and the front of B11T. Make sure that F17 is parallel to the centerline of the model. Repeat for the other side. (Photo 88)



Photo 88

- 90. Make sure that F17 follows the lines of F14. Once you're satisfied, glue F17 to K3/K4, B10T and B11T. Repeat for the other side. (Photo 89)



Photo 90

- 91. Cut from their sheets two FH1, two FH2 and two FH3. (1/8" lite ply) Retrieve the 1/8" lite ply scrap (fuse jigs) that you saved earlier. Note that there are port hatch parts and starboard hatch parts. The hatch "hooks" go outboard. Cut four pieces of scrap 1/64" birch ply that are almost as wide as FH1/FH2 to act as spacers. Apply spray glue one side of the 1/64" ply and stick them to the back of B10T and the front of B11T. Spray glue onto the front of FH1 and the back of FH2. Carefully align and stick these to the 1/64" spacers. Position and glue FH3 between FH1 and FH2. Make sure to put the wide part of FH3 to the front. Cut and glue the 1/8" lite ply scrap to FH1 and FH2. Repeat for the other side. (Photo 89)

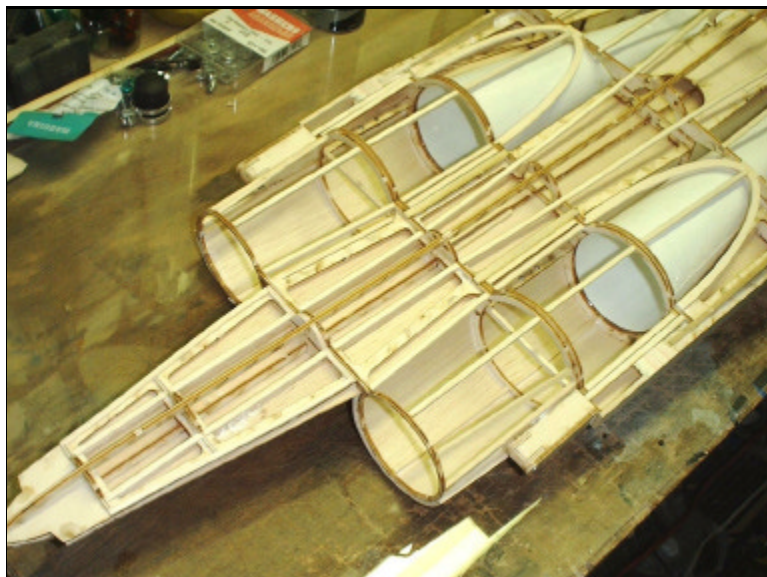


Photo 91

- ☐ 92. Working from the back to the front, glue 1/8" balsa stringers to the inside corners of the aft radome, along the outboard edge of the aft radome, between B12T and B11T, between FH1 and FH2 and between B10T and the top of the front of F14. (Photo 91)

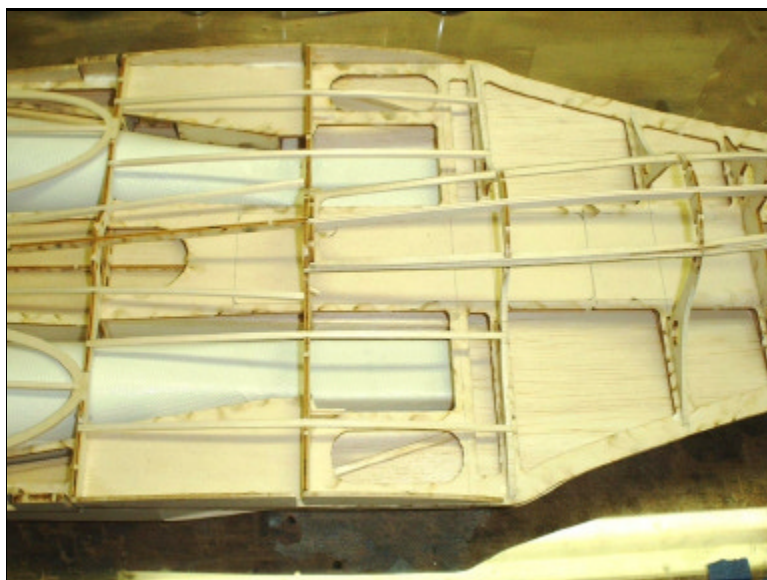


Photo 92

- ☐ 93. Continue gluing stringers at the inside corner joints on the fuselage spine and in the notches in B9T, B8T and B7T. (Photo 92)



Photo 93

- ☐ 94. Remove and set aside the two fan hatches, battery compartment hatch and cockpit hatches. (Photo 93)



Photo 94

- ☐ ☐ 95. Cut from their sheets one NG1, one NG2, one NG3 and one NG4. (1/8" lite ply) Insert four 2-56 T-nuts (not included) into the holes in NG1 and NG2. Make sure that the T-nuts are inserted into the tops of NG1 and NG2 so that the nose gear can be mounted from the bottom of the model. Using a square, align and glue NG1 to the inboard face of NG3 and NG2 to the inboard face of NG4. Cut two pieces of 1/4" triangle stock to the same length as NG1/NG2. Mark on the lower side of the triangle stock the location of the T-nuts in NG1/NG2. Using an razor knife, cut a shallow recess into the 1/4" triangle stock. Repeat for the other side. (Photo 94)



Photo 95

- ☐ ☐ 96. Align and glue the triangle stock to the top NG1/NG2 and the inboard face of NG3/NG4. Repeat for the other side. (Photo 95)

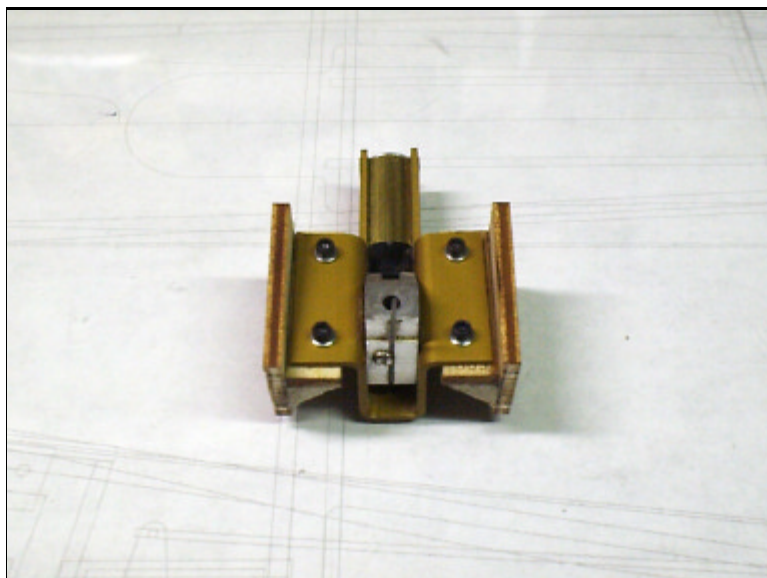


Photo 96

- ☐ 97. Bolt the nose gear retract unit to the two nose gear mount assemblies. (Photo 96)

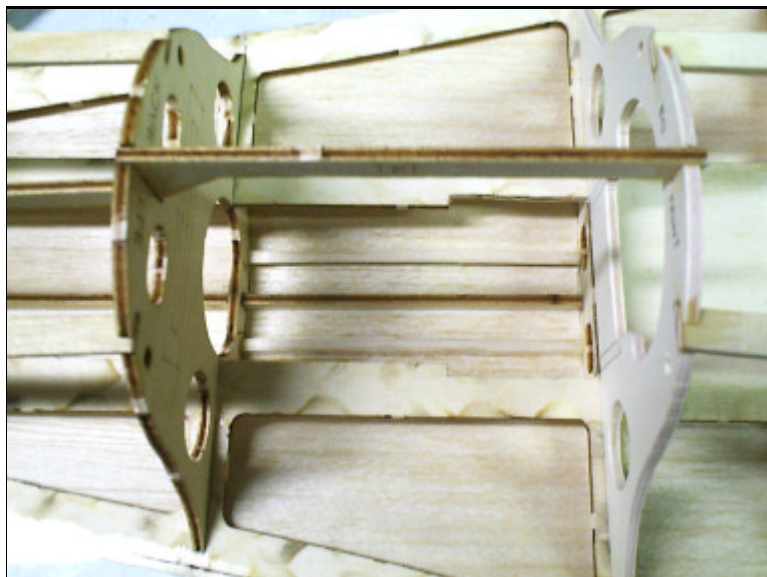


Photo 97

- ☐ 98. Cut two pieces of 1/8" balsa and glue to the inside of the bottom fuselage sheeting between B4T and B5T. (Photo 97)

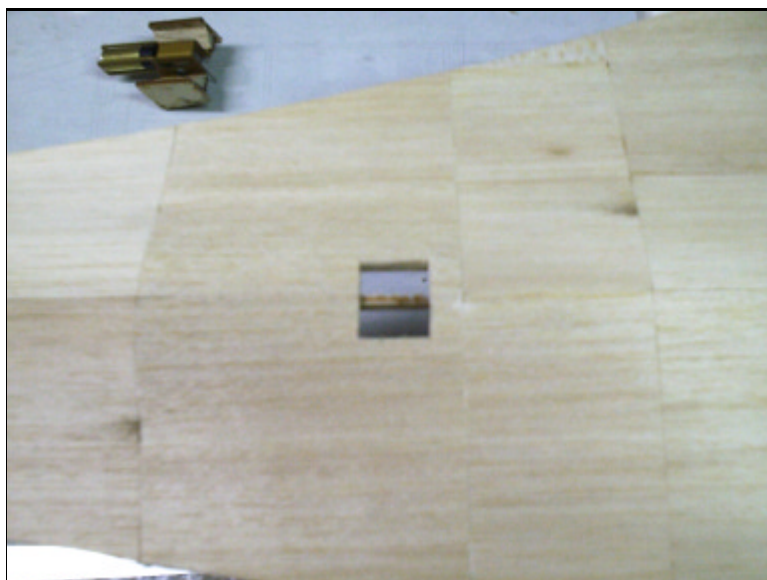


Photo 98

- ☐ 99. Cut a small 3/4" square access hole between the two 1/8" stringers you just installed and about 1/4" ahead of B5T. Cut away the exposed portion of K5. (Photo 98)

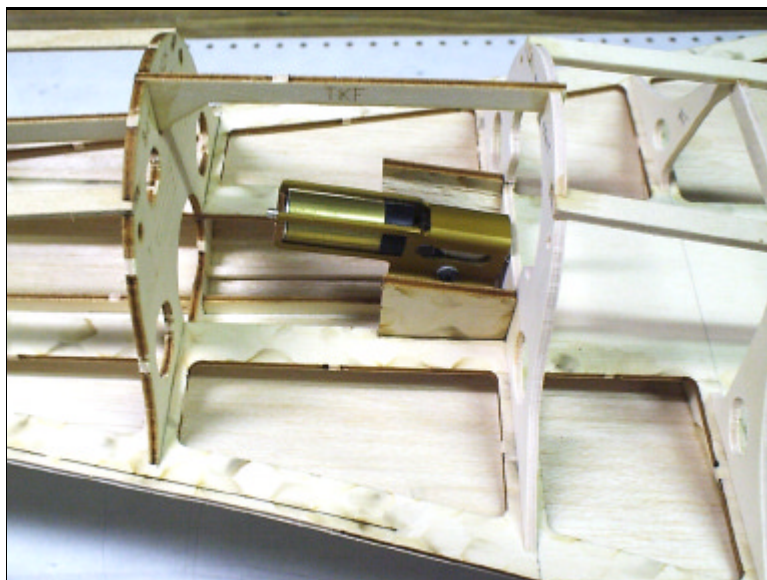


Photo 99

- ☐ 100. Insert the nose gear/mount assembly into the notch cut into the center of K1. Slip a straight piece of landing gear wire (not included) into the access hole in the bottom of the fuselage and into the nose gear unit. Using the landing gear wire as an alignment aid, sight down the front of the model and square the nose gear/mount assembly to the model. Once you're satisfied, glue the mount to the top of K1 and the front of B5T. (Photo 99)

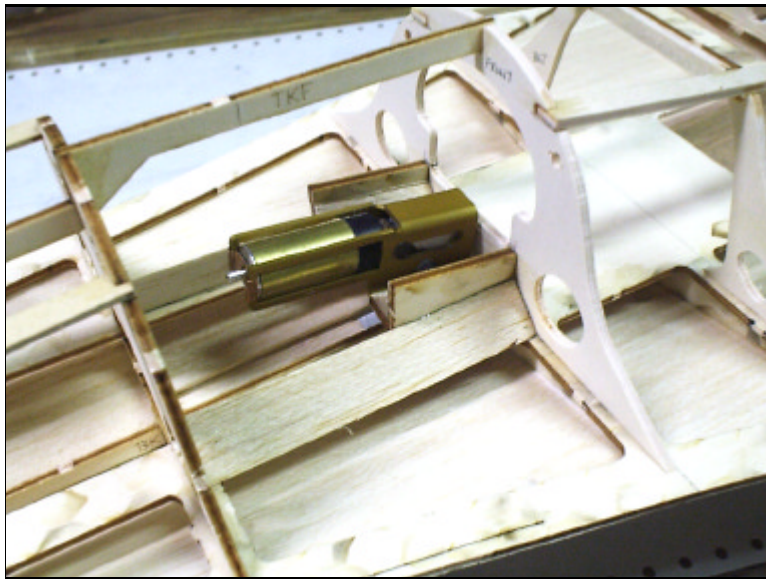


Photo 100

- ☐ 101. Cut and glue pieces of 1/4" balsa triangle stock to the top of K1, the outboard face of NG3/NG4, the back of B4T and the front of B5T. (Photo 100)

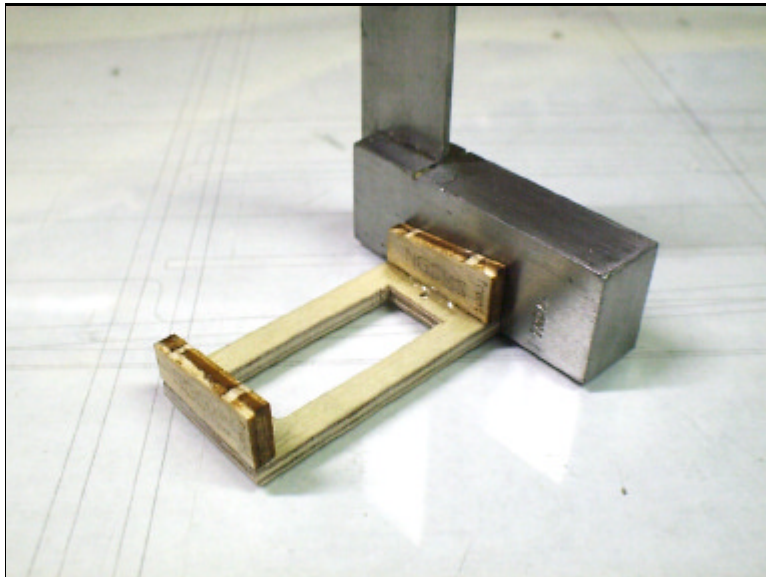


Photo 101

- ☐ 102. Cut from their sheets the nose gear steering mount pieces. One SM1, one SM2 and one SM3. (1/8" lite ply) Using a square, glue SM2 and SM3 to SM1. (Photo 101)

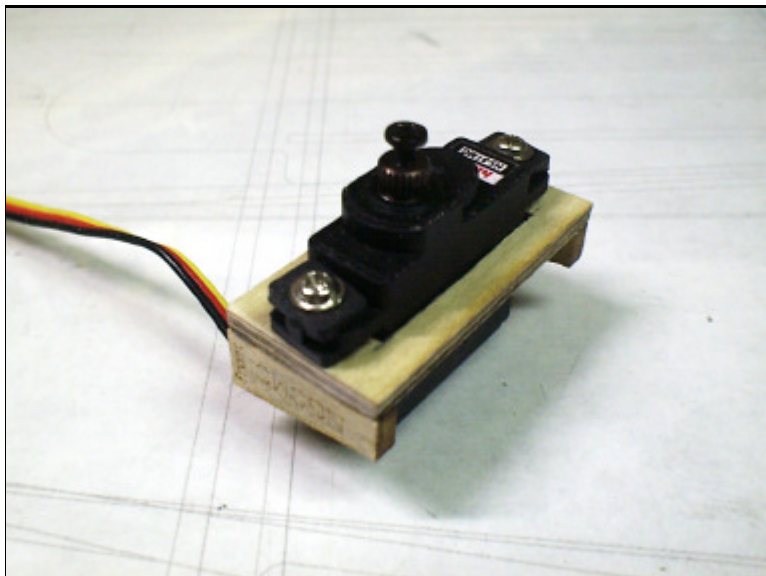


Photo 102

- ☐ 103. Mount the nose gear steering servo to the top of the servo mount. (Photo 102)

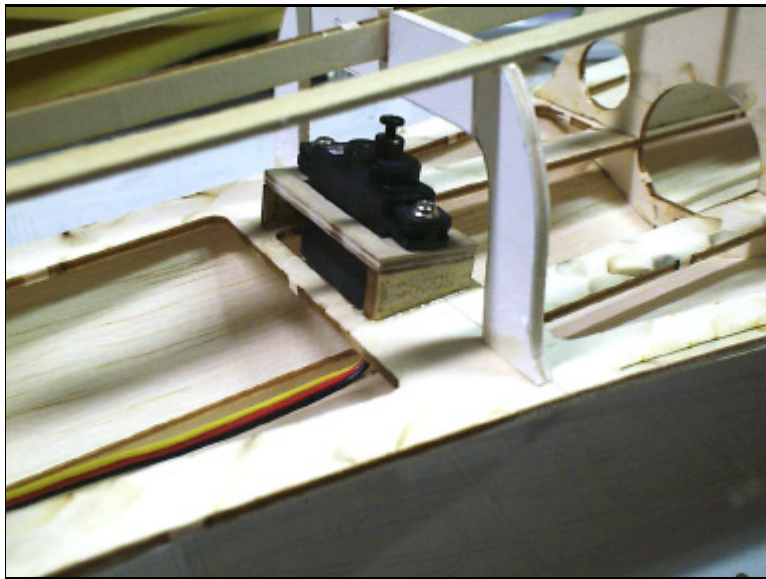


Photo 103

- ☐ 104. Align and glue the servo mount to the top of K1. Make sure that the servo output shaft is centered on the fuselage centerline and that the mount angles down back toward the nose gear. (Photo 103)

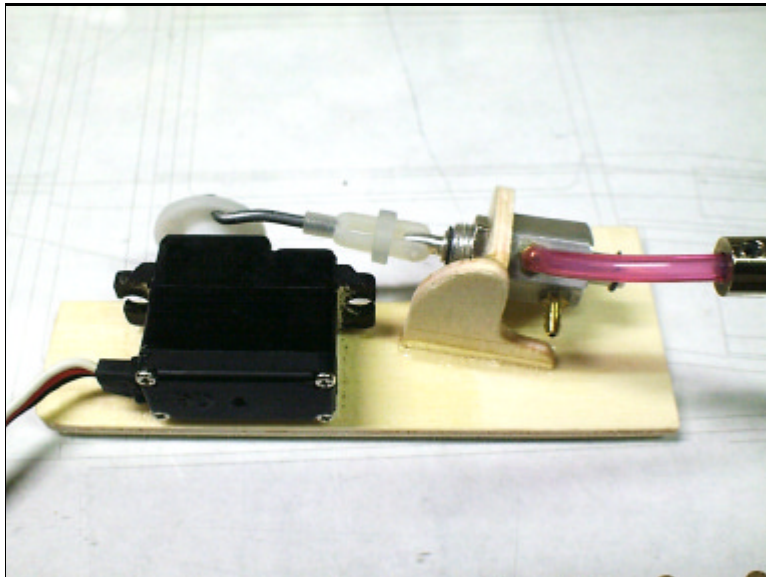


Photo 104

- ☐ 105. Cut from their sheet one RS1, one RS2 and one RS3. (1/8" lite ply) Position and glue RS2 and RS3 to the inboard face of RS1. Install your retract switch into the hole in RS2. Use double-sided pressure-sensitive foam tape to mount the servo. Make up a linkage to operate the retract switch using 2-56 metal pushrod and a small nylon clevis. (not included) (Photo 104)

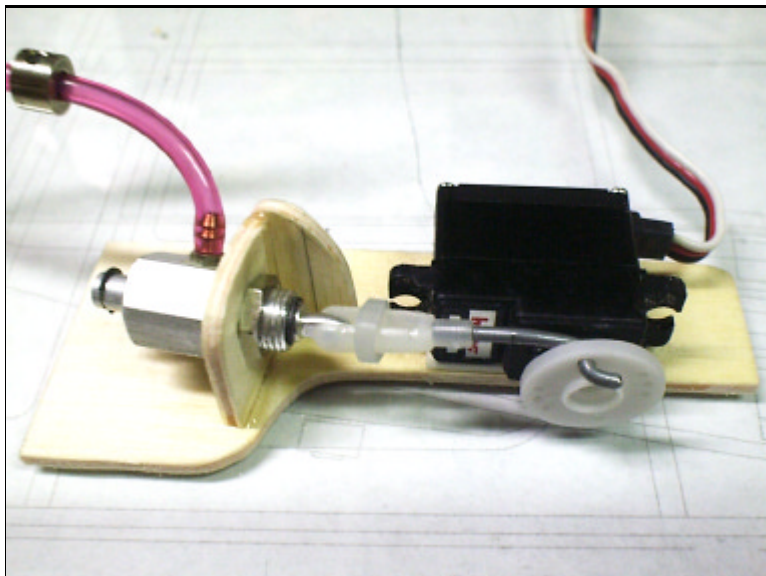


Photo 105

- ☐ 106. Test the operation of the retract switch to make sure the servo does not bind when actuating the retract switch. (Photo 105)

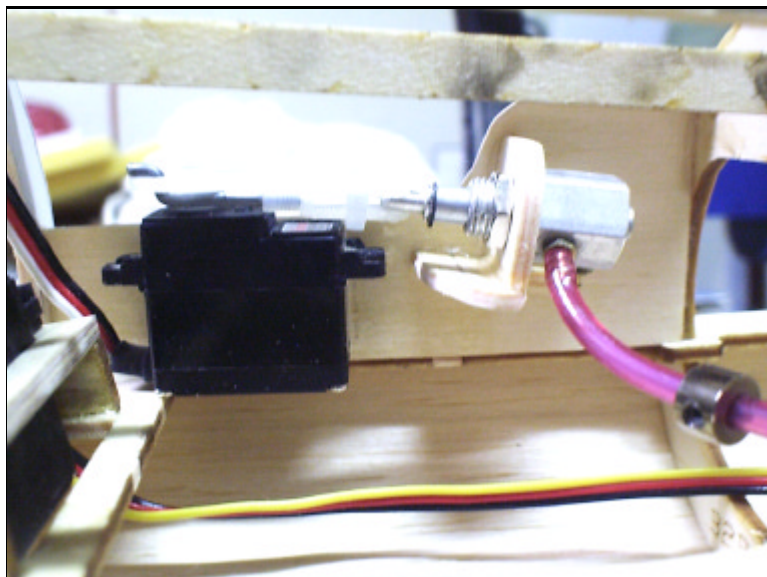


Photo 106

- 107. Mount the retract switch assembly far enough outboard so that it doesn't get in the way, but far enough inboard so that you can still get to it once the fuselage is sheeted. (Photo 106 & 107)

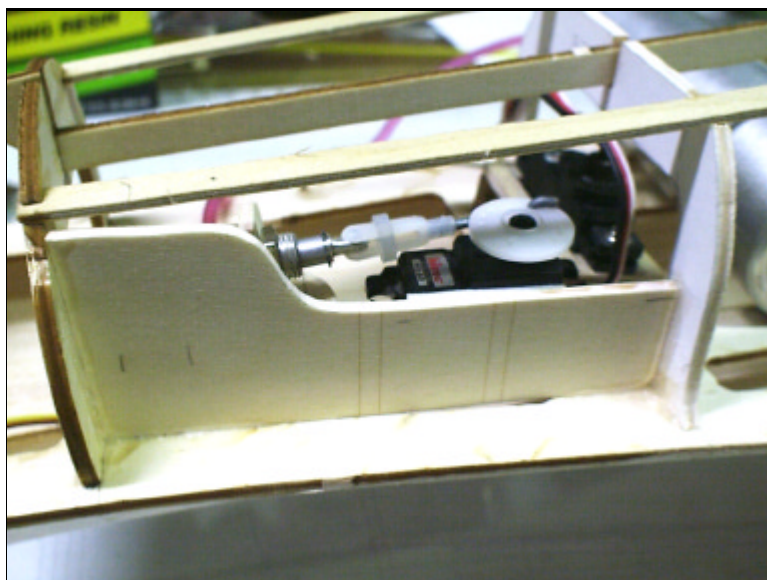


Photo 107

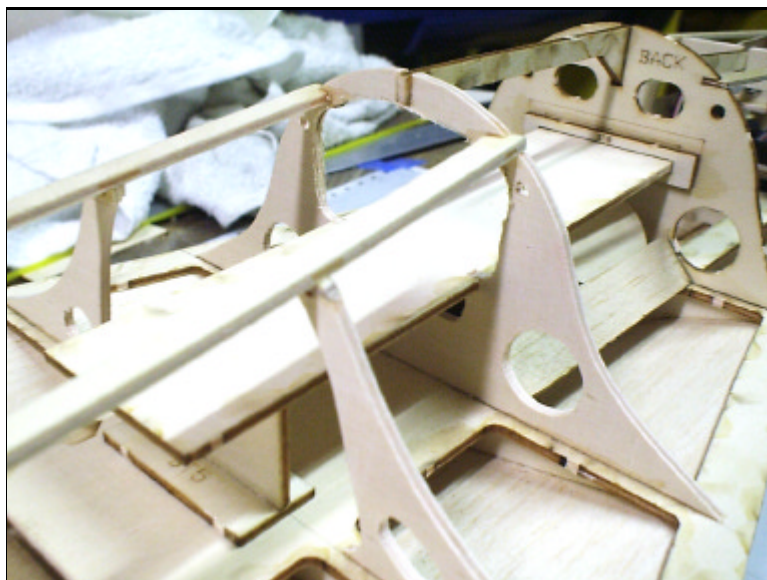


Photo 108

- 108. Cut from their sheet battery tray pieces. One BT1, one BT2, one BT3, one BT4, one BT5. (1/8" lite ply) Glue the parts together to make up the removable battery tray. Test the fit to make sure it clears the nose gear and fits into BT8. You might want to even test putting the batteries in through the battery compartment opening to make sure they will fit once the sheeting goes on. Locate two self-taping wood screws and use them to secure the battery tray to K1. Once complete, remove and set aside the battery tray for now. (Photo 108)

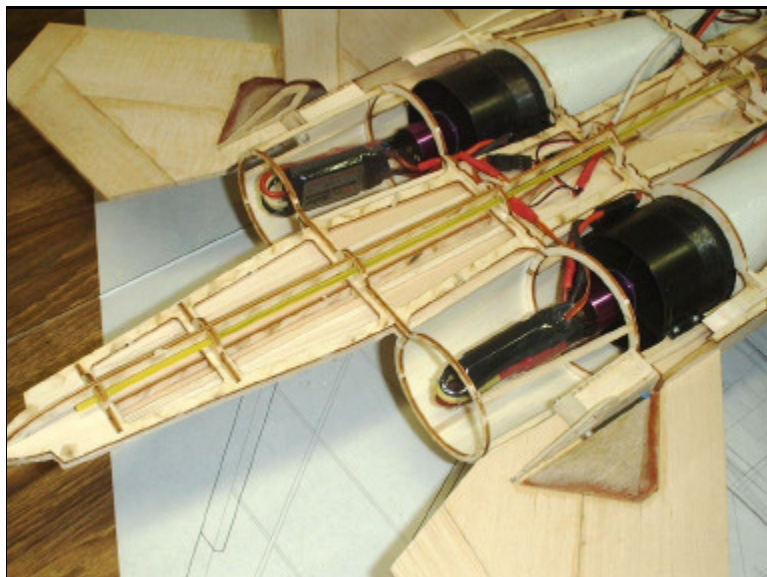


Photo 109

NOTE: The upper fuselage is now framed up and is ready for you to finish the installation, plumbing and wiring of all of the components. There are several areas you'll need to address. It's important to take care of these areas now as you will not have access to most of these areas once the top of the fuselage is sheeted.

The yellow tube that is in the aft radome boom is the antenna tube. Using a tube like this allows you to keep the antenna hidden to make the model look more scale and to protect it from accidental damage. Temporarily install the elevons then make up the elevon linkage.

You should decide where in the model you want to mount the speed controllers. On the prototype, these were hung off the back of the fan motors so they would receive maximum cooling air. If you're concerned about wire length between the batteries and speed controllers, they could also be mounted to the top of the inlet liners between B8T and B9T with either hook and loop fasteners or pressure-sensitive foam tape.

Using the template on the plans and the supplied .007" clear plastic sheet, make up two tailpipes. Using a fine-grade of sandpaper, scuff the joint areas to give the glue some bite. Roll and glue the tubes to form the tailpipes. Make sure to check the fit so that it will slip easily, but snugly over the back of the fan unit. Make sure that the back fits snugly into the tailcone.

Route the servo extensions to the elevon servos, the air lines to the main retracts and if you installed ailerons, cut holes in F11 and route the servo extensions through there.

Decide how you would like to retain the batteries. On the prototype, a self-grabbing hook and loop fastener strap was routed under K1A just ahead of B7B-1 to retain the aft battery pack and another strap was routed under the removable battery tray between B5T and B6T.

If you haven't already done so, bend the wire landing gear struts according to plan. Install the struts into the retracts. Cut out the main gear wheel wells from the main landing gear fairings between B7B-1 and B8B. Cut out an opening over the main gear mount. Install the main gear retracts and struts.

Cut out the bottom of the fuselage between B3T, B4T and B5T to create the nose gear wheel well. Be careful not to make it too small which could cause the retract to jam. Install the nose gear retract and strut.

Test the operation of the retracts to make sure there's no air leaks and that the landing gear can operate freely both up and down.

For the nose gear steering servo, it's best if you can use one

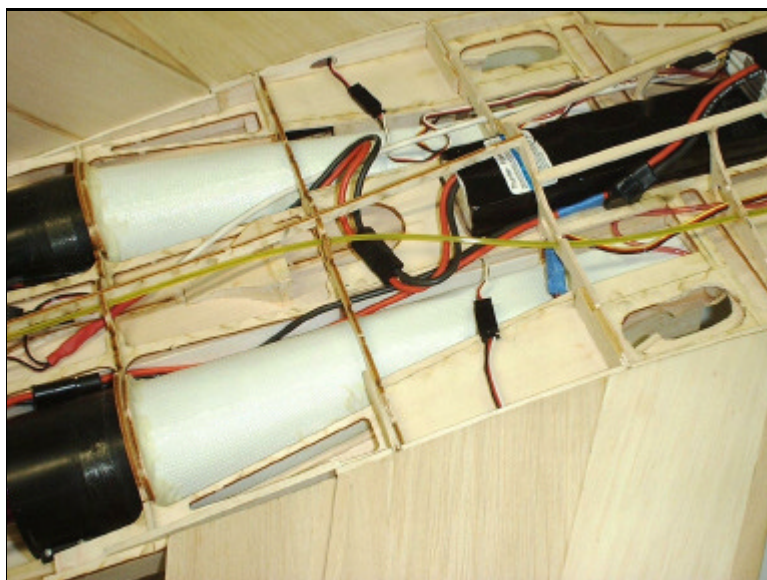


Photo 110

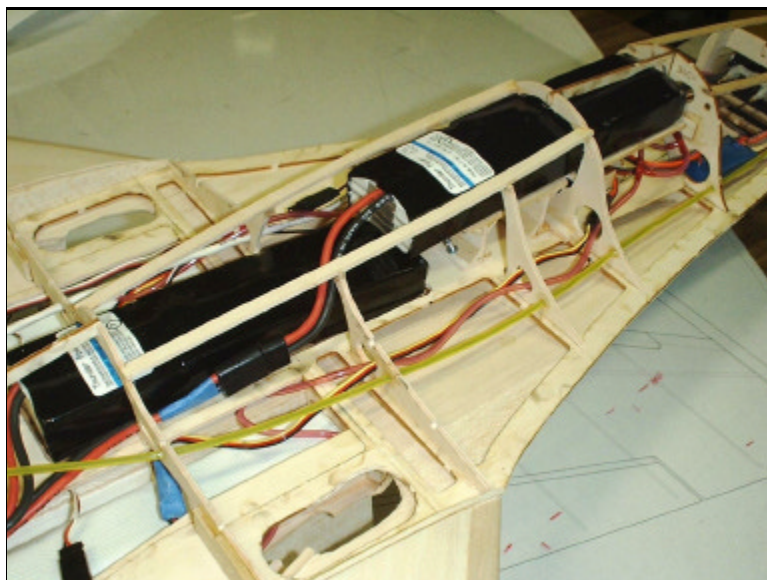


Photo 111

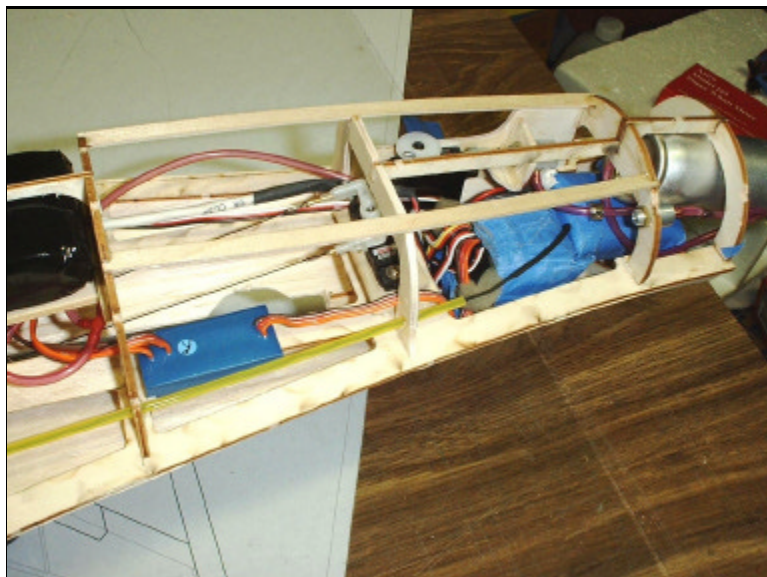


Photo 112

that has ball bearings on the output shaft. Using kevlar thread or the equivalent, make up the nose gear steering servos. These should be snug, but not taut. If you're having problems with the steering cables fouling in the nose strut, try giving each side a couple of twists. This should cause the steering cable to coil itself when the tension is released. Mount the retract filler valve.

Once the installation of all components, wires, tubes, etc. is complete, remove as much of the components such as the radio system, servos, receiver, receiver pack, battery tray, etc.

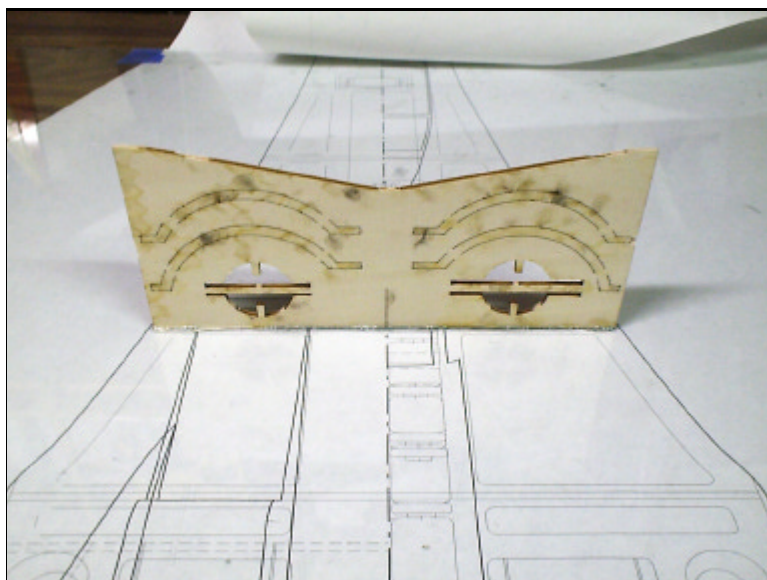


Photo 113

- ☐ 109. Cut from their sheets B6B jig and B12B jig. (1/8" lite ply) Glue B6B over the plans at the locations of B6B. (Photo 113)

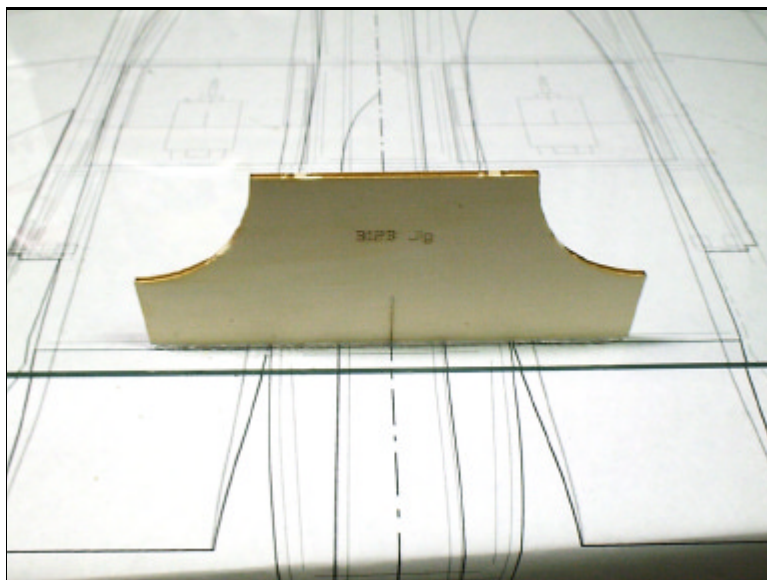


Photo 114

- ☐ 110. Glue B12B over the plans at the locations of B12B. (Photo 114)

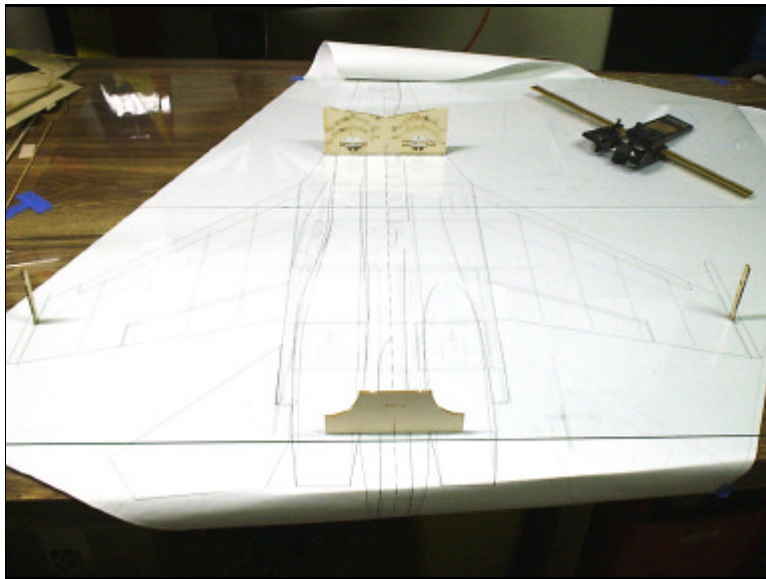


Photo 115

- ☐ 111. Cut from their sheet two Wing Tip Jigs. (1/8" lite ply) Secure these to the building board over the plans. (Photo 115)

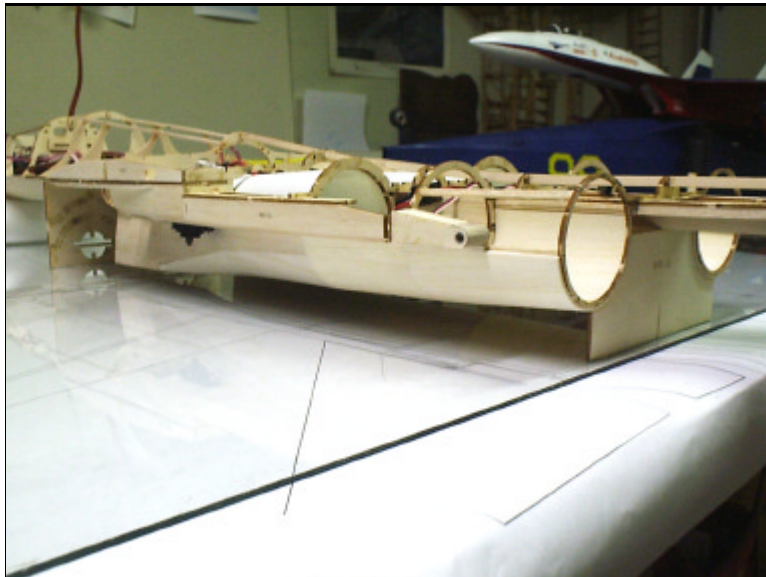


Photo 116

- ☐ 112. Carefully place the fuselage into the jigs and lightly tack glue it to the jigs. (Photo 116)



Photo 117

- ☐ 113. Trial fit, but do not glue the wings to the fuselage. Secure the wings to the fuselage with spring clamps. Use an incidence meter to make sure that the wings are straight and not twisted. Make sure that the top of the wing does not extend more than 3/32" above the tops of F10/F11/F12. Trammel the wings to fuselage to make sure they're square. When satisfied, mix up some slow-set epoxy. Remove one wing at a time from the fuselage. Apply glue to the back face of B8T and B9T and to the front face of FSS and RSS. Apply epoxy to the outboard face of F11/F12 and to the inside face of wing rib R1. Clamp wing back into fuselage. Double check incidences. (Photo 117)



Photo 118

- 114. To make sure that the wing tip doesn't lift from the Wing Tip Jig, lightly tack glue the wing tip to the jig. Allow the wing joints to dry overnight. (Photo 118)

Note: Before moving on to Step 115 sand the profile of the flat portion of the aft radome to a slight curve. (See plans)

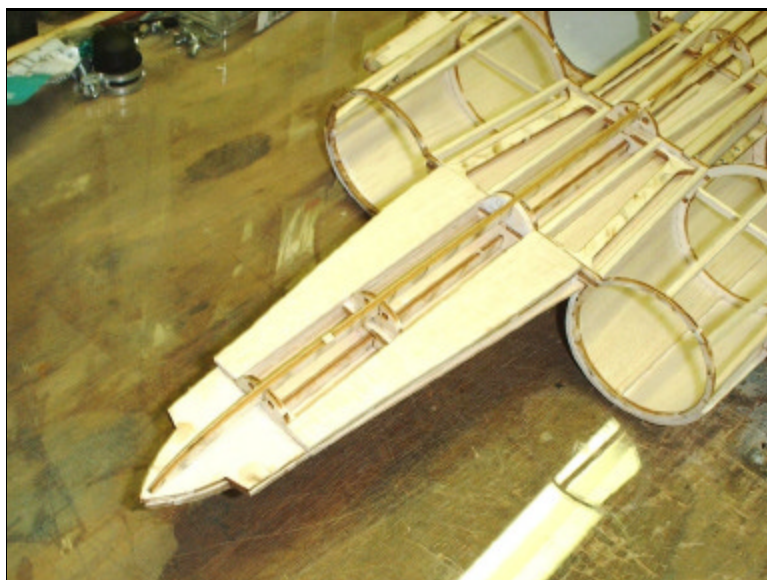


Photo 119

- 115. Remove the model from the jigs. Working from the tail to the nose, use the supplied 3/32" balsa to sheet the flat portion of the aft radome and fuselage between B14T and B11T. (Photo 119)



Photo 120

- 116. Using 3/32" balsa sheet the flat portion of the fuselage between the engine nacelles and B11T and B10T. Make sure to leave the inside 3/32" of F16 exposed. This will form a recessed shelf that the fan hatches will fit into. Sheet the flat portion of the fuselage outboard of the engine nacelles between B11T and B10T. Leave the inside 3/32" of F17 exposed to form the recessed shelf for the fan hatch. Notch the outboard forward corner to form the aft rudder pocket. Sheet the flat portion of the fuselage between the engine nacelle fairings. Make sure to leave the inside 3/32" of F14 exposed. This will form a recess into which the engine fairing sheeting will mate. (Photo 120)

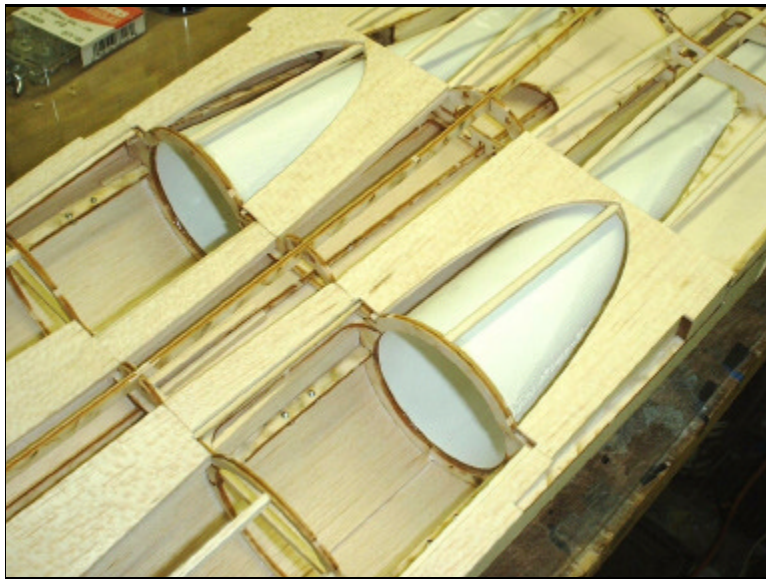


Photo 121

- ☐ 117. Using 3/32" balsa sheet the flat section outboard of the engine nacelle fairing. Notch the outboard edge to complete the rudder pocket formed by F12 and F13. (Photo 121)



Photo 122

- ☐ 118. Using soft 3/32" balsa sheet the round portion of the aft radome between B14T and B12T. (Photo 122)



Photo 123

- ☐ 119. Sheet the round portion of the fuselage between the engine nacelles and B10T and B9T. (Photo 123)



Photo 124

- 120. Using 3/32" balsa sheet the tops of the engine nacelles between B12T and B11T. Carry the sheeting all the way to the bottom of the stringer that runs along the top of the elevon mount. Repeat for the other side. (Photo 124)



Photo 125

- 121. Cut from their sheets two F19 (1/4" balsa) nacelle filler blocks. Insert F19 into the open area between the upper and lower fuselage sheeting aft of the elevon mount. Make sure that F19 only extends far enough inside the nacelle to fill the opening leaving any excess outside the fuselage. This will be sanded off when you final sand the model. Repeat for the other side. (Photo 125)



Photo 126

- 122. Using 3/32" balsa sheet the forward portion of the engine nacelle fairings between B10T and B9T. (Photo 126)



Photo 127

- 123. Using 3/32" balsa sheet the outboard section of the fuselage between B9T and B7T. Repeat for the other side. (Photo 127)

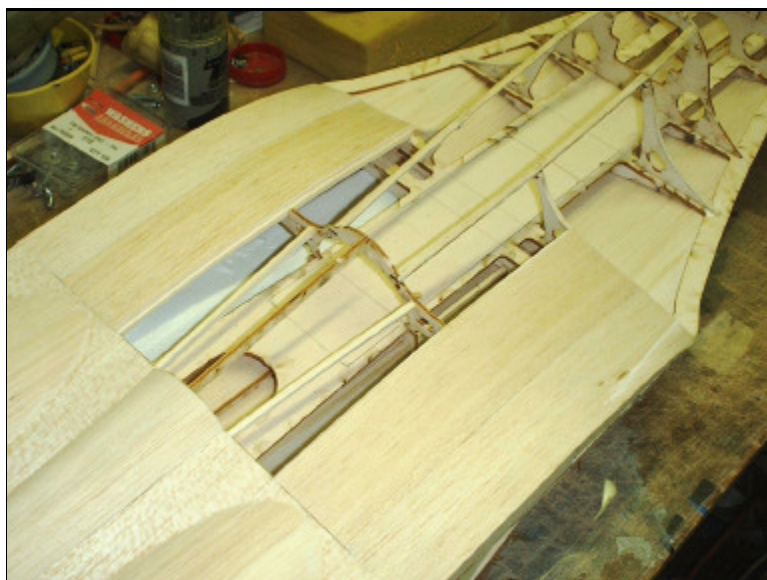


Photo 128

- 124. Using 3/32" balsa, continue sheeting the section of the fuselage toward the centerline between B9T and B7T Repeat for the other side. (Photo 128)



Photo 129

- 125. Using 3/32" balsa sheet the section of the fuselage between B9T and B8T. Repeat for the other side. (Photo 129)



Photo 130

- 126. Using 3/32" balsa sheet the round portion of the fuselage between B9T and B8T. Sheet the section of the fuselage between B8T, B7T and BCR. Repeat for the other side. (Photo 130)

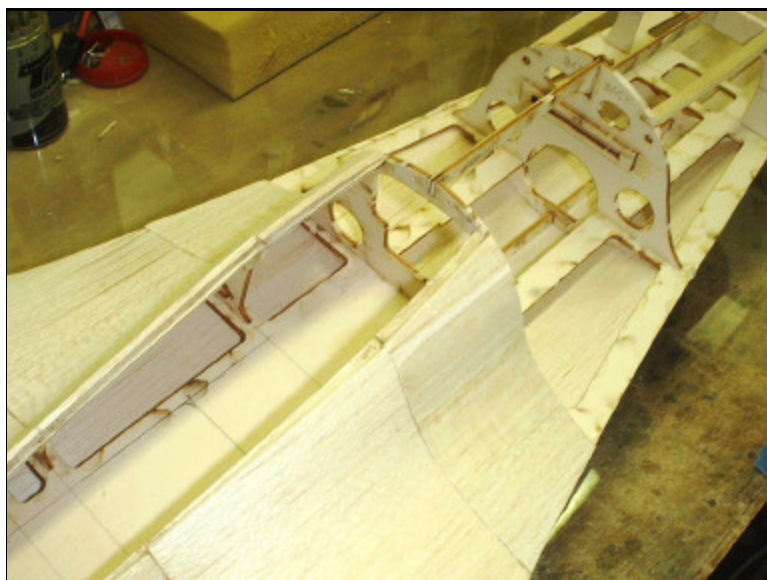


Photo 131

- 127. Using 3/32" balsa, continue sheeting the fuselage between B7T, B6T and BCR, then between B6T, B5T and BCR. Repeat for the other side. (Photo 131)

NOTE: Make sure to taper the underside of the sheeting where it contacts K1 just like you did in Steps 55-56.

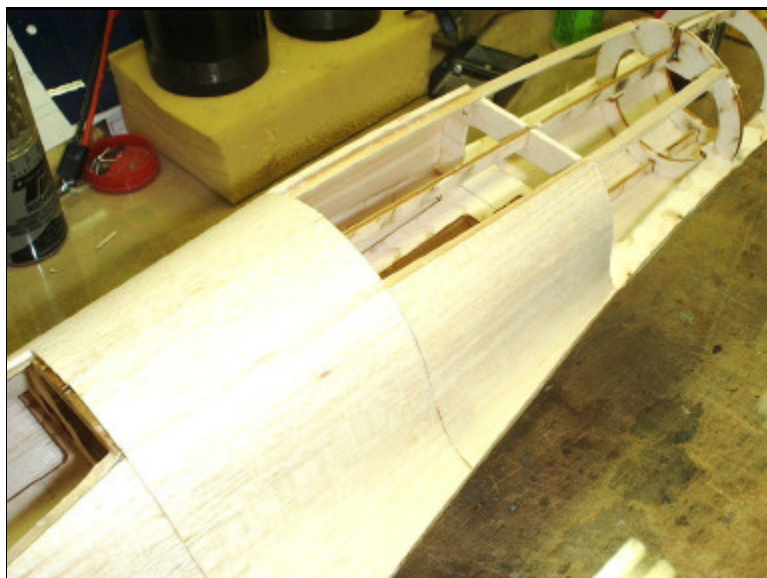


Photo 132

- 128. Using 3/32" balsa, continue sheeting the fuselage between B5T and B4T. Sheet the fuselage between B4T, B3T and CHR. Repeat for the other side. (Photo 132)

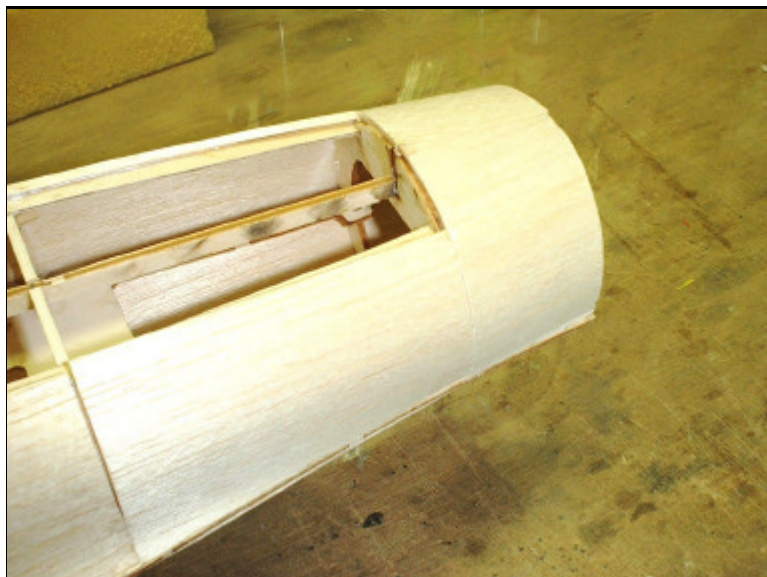


Photo 133

- 129. Using 3/32" balsa, continue sheeting the fuselage between B3T, B2T and CHR. Sheet the fuselage between B2T and B1T. Repeat for the other side. (Photo 133)

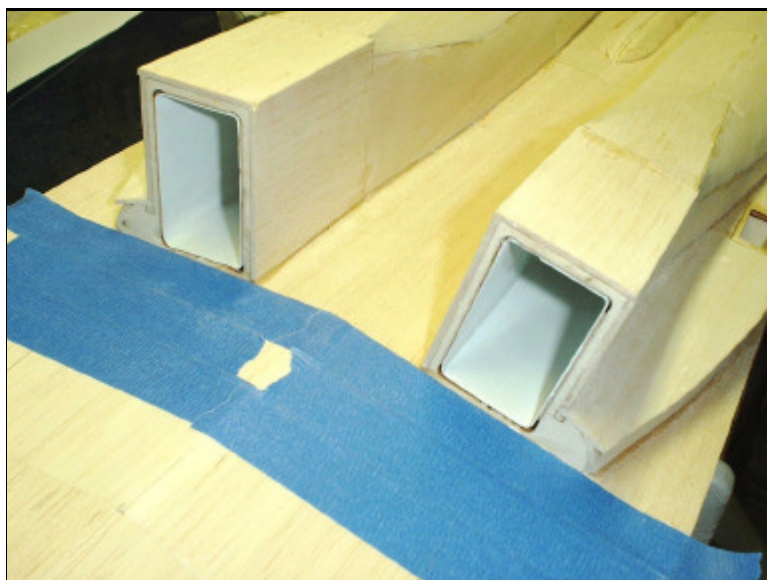


Photo 134

- 130. Lay down a few strips of masking tape to protect the bottom fuselage sheeting. Using sandpaper or a high-speed rotary tool and sanding drum, remove the excess portion of the inlet liners that is sticking out of B7B-2. When satisfied, remove the masking tape. Repeat for the other side. (Photo 134)

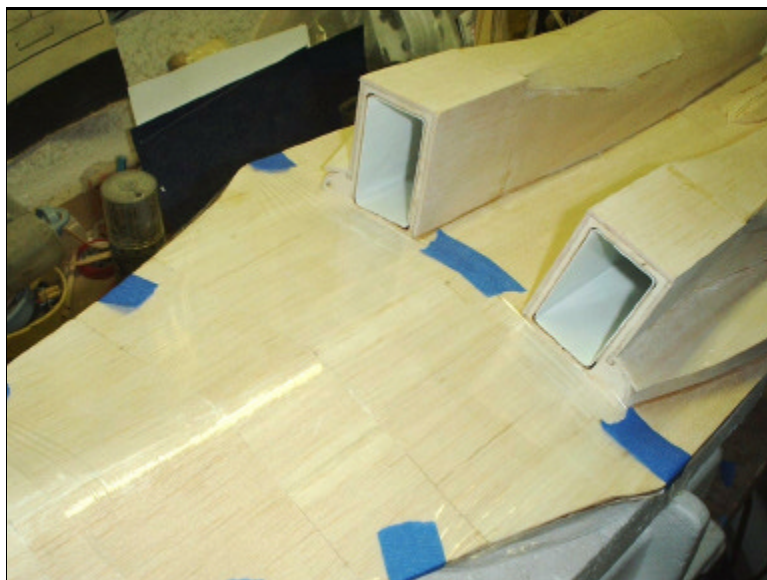


Photo 135

- 131. Stretch and tape a piece of sandwich wrap to the bottom fuselage sheeting between B7B-2 and B4B. (Photo 135)

NOTE: The next few steps detail the construction of the inlet lips. The pieces of wood that make up the inlet lips should be glued together when instructed, but the inlet lip assembly itself does not get glued to the model yet.

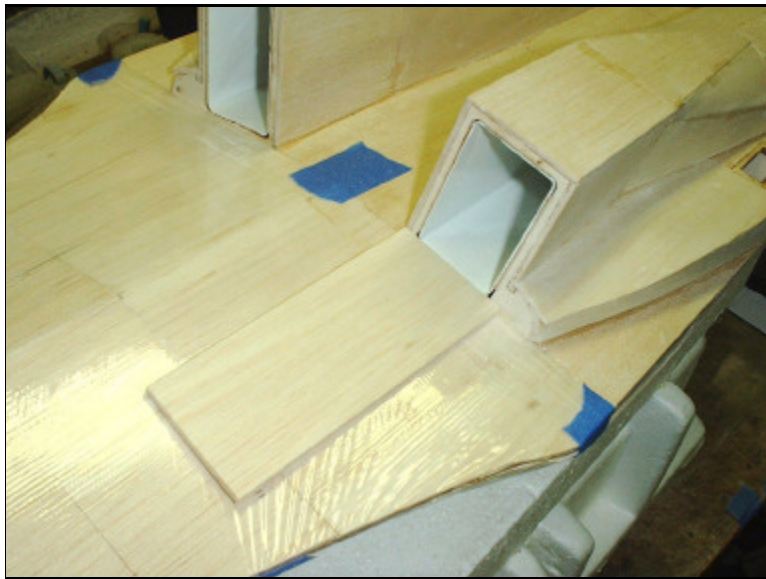


Photo 136

- 132. Cut from their sheeting four IL1, four IL2, two IL4 (1/4" and 1/16" balsa) and two IL3 (1/8" balsa). Position, but do not glue IL3 on the bottom fuselage sheeting in front of B7B-2. (Photo 136)

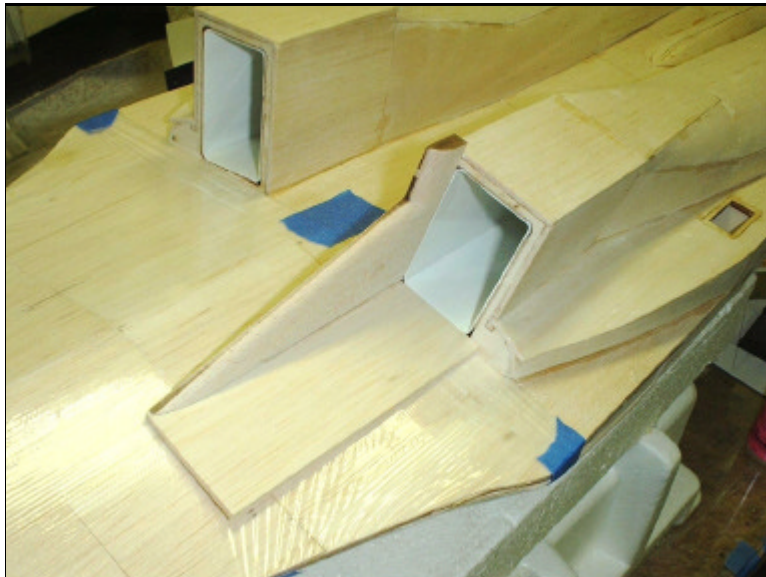


Photo 137

- 133. If the cross-section of the inlet portion of the fuselage is thicker than 1/4" then laminate the 1/16" inlet lip pieces to the outside faces of the 1/4" inlet lip pieces. (IL1 & IL2 only) Position IL1 onto IL3 and against the front of B7B-2. Position, but do not glue IL1 so that the inside face of IL1 is flush with the inside inlet liner wall. Any excess should be sanded off the outside of IL1. Sand the inside of IL1 to an shape resembling the front of an airfoil. Position and glue IL1 against IL3 so that IL3 rests flush against the bottom fuselage sheeting. (Photo 137)



Photo 138

- 134. Repeat the process described in Step 132 for IL2. (Photo 138)

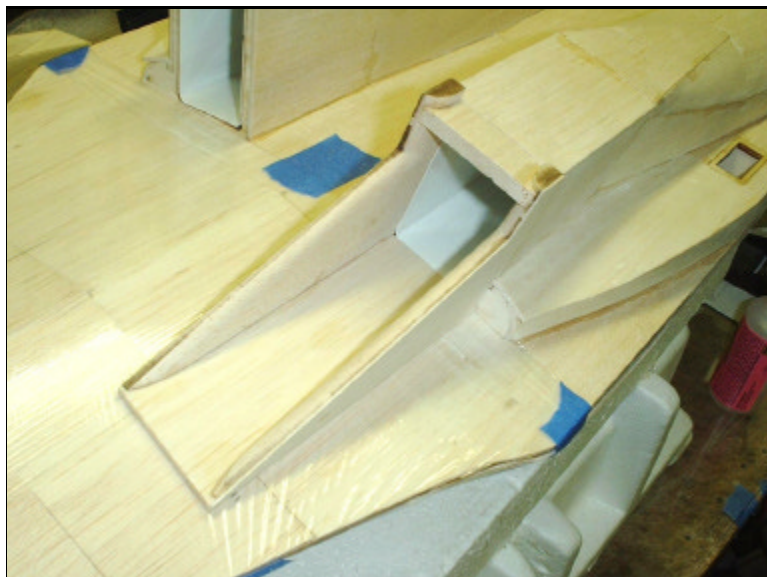


Photo 139

- 135. Position and glue IL4 between IL2 and IL3. Remove the inlet lip and repeat Steps 131-134 for the other inlet lip. Sand an airfoil shape into the inside of IL4 so it matches the cross-section of the other inlet lip pieces. Sand the front of IL1 so it is rounded. When the other inlet lip is complete, remove the sandwich wrap from the fuselage. Repeat Steps 132-135 for the other side. (Photo 139)

NOTE: While it is not 100% necessary, it is easier to finish the inside of the inlet lip pieces while they are off the model. Once the finishing is complete, align and glue the inlet lips to the bottom fuselage sheeting and to the front of B7B-2, then continue with Steps 136.



Photo 140

- 136. Cut from their sheets six F19 (1/4" balsa) Laminated three F19 to form two filler blocks that are 3/4" thick. Repeat for the other side. (Photo 140)



Photo 141

- 137. Position F19 on the fuselage sheeting so it is touching the front of B7B-2 and the outboard face of the inlet lips. Trace the outline of B7B-1 onto the aft face of F19. (Photo 141)



Photo 142

- 138. Shape F19 to match the contours of the main landing gear fairing. (Photo 142)



Photo 143

- 139. Once satisfied with the shape, glue F19 to the bottom fuselage sheeting, to the sides of the inlet lip and to the front of B7B-2. Repeat Steps 137-139 for the other side. (Photo 143 & 144)



Photo 144

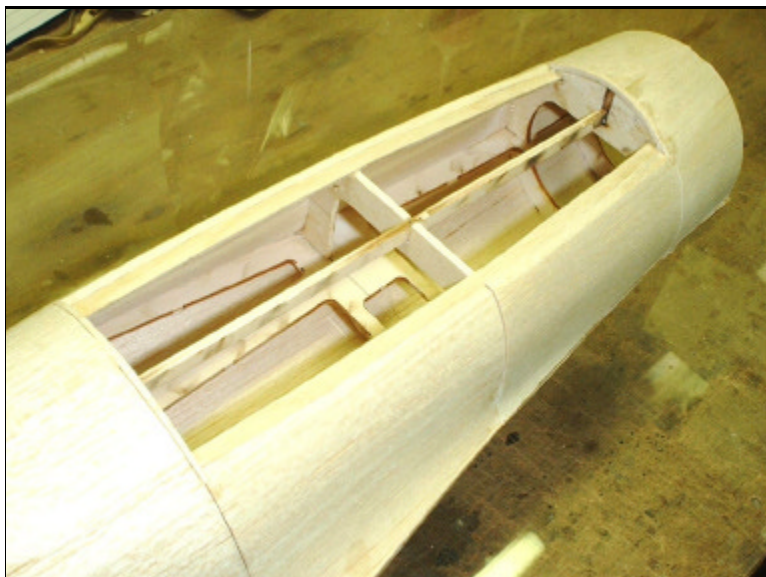


Photo 145

Hatch Sheeting

NOTE: The hatches are very lightly built. As a result, they warp very easily. Unlike the rest of the fuselage, you should not wet the balsa as it will warp the hatches.

- ☐ 140. Sand the balsa sheeting flush with the top of CHR and with the back of B2T and the front of B4T. (Photo 145)



Photo 146

- ☐ 141. Lay some sandwich wrap flat on some newspaper and apply a light mist coat of spray glue to one side. Pulling the the sandwich wrap smooth, lay it glue side down onto CHR. Rub it down so that it conforms to the top of CHR, the back of B2T and the front of B4T. This will form a glue barrier that will allow you to sheet the hatch while in place on the fuselage without having to worry about gluing the hatch into place. (Photo 146)



Photo 147

- ☐ 142. Apply a light mist coat of spray glue to the underside of CHB. Carefully place the cockpit hatch into place on top of the sandwich wrap. Rub CHB down so it mates smoothly with both cockpit rails. (CHR) (Photo 147)



Photo 148

- ☐ 143. Using the lightest, softest 3/32" balsa included in the kit, sheet each side of the cockpit hatch in one piece. (Photo 148)



Photo 149

- ☐ 144. Repeat the process to sheet the battery compartment hatch. (Photo 149)



Photo 150

- ☐ ☐ 145. Cut oversize pieces of 3/32" balsa and glue each of them to the top of the flat sections of the fan hatches. Carefully sand each so that the hatches will rest on the recessed shelves you built in Step 116. (Photo 150)



Photo 151

- 146. Apply a thin layer of glue to the front and rear of one half of the round portion of the fan hatches. Using the lightest, softest 3/32" balsa included in the kit, sheet each side of the fan hatches in one piece. (Photo 151)



Photo 152

- 147. Repeat the process for the other fan hatch. Repeat Steps 146-147 for the other side. (Photo 152)



Photo 153

- 148. Carefully remove the fan hatches from the fuselage. Reinforce the inside of the glue joints. If the hatches don't fit perfectly, wet the outside of the fan hatch balsa sheeting and insert them into their hatch pockets. Lay a sandwich baggie sandbag on each hatch and allow them to dry overnight. Once the hatches are dry, drill the hatch screw holes through FH3, F15 and K1. Repeat for the other side. (Photo 153)



Photo 154



Photo 155



Photo

Miscellaneous Construction

□ 149. Sand the fuselage sheeting flush with the front of B1T. Cut from it's sheeting one F22. (1/8" lite ply) Center F22 on the alignment mark in B1T and glue into place. (Photo 154)

□□ 150. Sand the fuselage sheeting flush with the back of B12T. Cut from their sheeting two F23. (1/8" lite ply) Center each F23 on the inside hole in B12T and glue into place. Repeat for the other side. (Photo 155)

□□ 151. Cut from their sheets six MR (1/8" balsa) Laminate three MR together to form a missile rail. Be sure to build a right missile rail and a left one. There are etched lines that should go on the inboard side which will aid in aligning them with the wing tip ribs. Repeat for the other side. (Photo 156)

NOTE: Do not glue the missile rails to the wing tips at this time. Instead these should be added only after the fuselage and wings are completely sanded.

This concludes most of the basic construction of the model.

Finishing

Insert the fan units into the fuselage. Insert the tailpipes into the fuselage through the openings in B12T and slip them over the aft portion of the fan units. Bolt the fan units into place. Sighting from behind the fuselage, verify the alignment of the tailpipes to make sure they're both parallel to the centerline of the fuselage and with each other. Once satisfied, slip the tailcones over the tailpipes and into place onto B12/F23. Make sure they don't distort the tailpipes. If they do, then carefully sand the leading edges of the tailcones until they're centered without distorting the tailpipe.

Fit the nose cone to B1/F22 and temporarily tape into place. Sighting from the front and rear, verify that the nose cone is aligned with the centerline of the fuselage. If the nose cone is canted off to one side or the other, carefully sand the trailing edge of the nose cone until it is aligned with the fuselage centerline. Once satisfied with the fit, scuff the inside of the fiberglass parts and glue the fiberglass nose cone to B1/F22 and the tailcones to B12/F23.

Fit the lower elevon actuator pocket to the outboard face of the elevon mount. This should be flush with the bottom of the elevon mount. Make sure to check to make sure this fits with the upper actuator pocket in the base of the vertical fin. When satisfied with the fit with the vertical fin, glue the lower actuator pocket to the outboard face of the elevon mount. Repeat for the other side.

IMPORTANT: The lower fuselage should be reinforced with 6 oz. fiberglass cloth and epoxy resin. You'll need two 2" x 6" strips. Make sure to orient the fabric so the weave is on a 45-degree bias. This will help it fold into the inside corners. Mix up some slow-set, low-viscosity epoxy resin. Using an acid brush, apply the epoxy to one inch each of the inside corners of the fuselage and nacelle sheeting between B8B and B9B. Fold the cloth in half, lengthwise. Lay the fold into the inside corner between B8B and B9B and work the resin into the fabric with a small brush. To get a glassy smooth finish, stretch and tape plastic sandwich wrap over the wet epoxy. Burnish the edges of the epoxy under the plastic wrap for a super-smooth feathered edge. Set aside to dry overnight.

Sand the entire model smooth. The tail feathers and sub fin may be streamlined or left flat with rounded leading and trailing edges. If you're going to streamline them, make sure to mark where the vertical fin mates with the fuselage and only streamline the fin above this point.

If you're going to cover the model with film, do not glue the sub fin to the fuselage at this time. Instead, cover everything first, then cut away the film from where the glue joints should be.

The Su-27 can be finished using a number of different methods. Since the entire model is sheeted, the model can be covered with a plastic film or it can be painted. If painted, then the balsa grain would first have to be filled using either a light sanding filler and/or a lightweight fiberglass job. If you're going to use plastic film, we recommend not gluing the vertical fins or the sub fins to the fuselage until after the fuselage is covered.

Place the model into B6B and B12B Jigs and make sure it is sitting level. Working on one side at a time, fit the vertical fin into it's pocket and trammel it to the wings to make sure it's square. When satisfied, mix up some medium-set epoxy and glue the vertical fin to the fuselage. Repeat for the other side.

Cut the canopy free from it's sheet. Follow the guidelines molded into the canopy sheet. The canopy is molded from Vivak, (PETG) so use any compatible glue to attach the canopy to the hatch.

Control Throws

If you're using elevons instead of the optional ailerons/elevators, you'll need some way to mix aileron/elevator functions. This could be in the transmitter or an external mixing unit carried on-board the model. The throws below describe the actual direction of movement of the control surface itself.

Elevon

Ailerons, measured at the forward tip of the elevons.

High rate: Up - 7/8", Down - 3/4"

Low rate: Up - 5/8", Down - 1/2"

Elevator, measured at the forward tip of the elevons:

High rate: Up - 1", Down - 7/8"

Low rate: Up - 5/8", Down - 1/2"

Aileron/Elevator

Ailerons, measured at the root of the aileron itself.

High rate: Up - 9/16", Down - 3/4"

Low rate: Up - 7/16", Down - 1/2"

Elevator, measured at the forward tip of the elevators:

High rate: Up - 1", Down - 7/8"

Low rate: Up - 5/8", Down - 1/2"

Balancing and Flying the Model

The model must be balanced before attempting flight.

Failure to properly balance the model will most likely result in the destruction of the model. The model should be balanced upright on a balancing stand. It should be balanced at the point shown on the fuselage, or 8-7/8" forward of the wing root trailing edge where it joins the fuselage. If the model doesn't balance at this point, try moving the internal components such as the receiver battery until it does balance at the point indicated.

Do not get impatient to fly the model. Instead, take your time to make sure everything is perfect before flying. You should work your way up to the first flight by taking the model out to the flying field and performing a good radio range check with the motors off, then again while running at full power. Follow this up with doing some ground taxi tests to verify that the model tracks straight and that it accelerates briskly. Make sure the nose wheel steering isn't too sensitive.

Once you're satisfied with the model, put a fresh charge on the receiver pack and the flight packs and pump up the retracts. Set the control throws to low rates for the initial test flights. Line the model up at the runway threshold and roll on the throttle. Because the model doesn't use rudders, the nose wheel steering will only be effective for the first few seconds of the take-off run. Once the vertical fins become effective, they will "lock" the model onto a heading, even in a moderately strong crosswind.

The model will require a take-off run of about 250-300 feet. Do not try to horse the model off the runway. This will only result in a stall and crash. Once at take-off speed, apply gentle back pressure and the model should rotate and rise off the runway. The landing gear can be raised at any point after this or may be left down for the first flight. Once airborne, concentrate on flying the model to a safe altitude where it can be trimmed for level flight.

The Su-27 is a modern design with a lot of wing area due to the shape of the fuselage. Raising the nose will increase the amount of drag it produces and really slow the model down. Because it is a very clean design, lowering the nose will allow the model to pick up quite a bit of speed. Be aware of this characteristic when landing the model.

When you're ready to land, fly the model to pattern altitude. You can lower the landing gear at any time. Most pilots like to perform a gear pass immediately after lowering the landing gear to visually verify that all three are down and locked. When the model is on downwind and abeam of the touchdown zone, reduce power to 1/2 - 3/4 throttle. The model should begin to descend. Do not let the model dive as this will only increase the amount of airspeed you'll have to bleed off before landing. Hold the model into a level flight attitude throughout the landing pattern with the elevator and control the rate of descent with throttle. When the model is 45 degrees from the touchdown zone, turn onto base leg, then onto final. At about 3 feet off the runway, reduce power to idle. The model should begin to slow to landing speed. Because the model is relatively lightly loaded, it is capable of remarkably slow flight. Raise the nose to landing attitude to flare and touch down. Allow the model to slow to taxi speed before trying to turn off the runway.

Perform a thorough post-flight check to make sure that no problems have cropped up during the first flight. Once you're satisfied that everything is in order, you may fly the model again. Take your time to get to know the model's handling characteristics. It is a very forgiving and stable model and should present you with no surprises.

Congratulations! You're now a Flanker pilot!

Materials Required for Construction

Below is a list of materials which are required for construction, but not included in the kit.

- 1/8" music wire or equivalent for landing gear struts
- 2 - 2-1/4" wheels for the main landing gear
- 1 - 1-1/2" wheel for the nose landing gear
- 3/16" wheel collars or equivalent wheel retainers
- 20 - 2-56 T-nuts to mount the fan units and retracts

Various wood screws to mount the servos, fan hatches and removable battery tray.

- 2 - Wemotec Minifan 480 fan units
- 2 - Brushless motors capable of producing 500-600W of power (each)
- 2 - Brushless speed controllers capable of producing 500-600W of power (each)
- 2 - 10 to 12 cell or equivalent motor battery packs capable of withstanding 40-50 amps of power draw

- 2-56 pushrods
- 2 - Dubro 1/16" ball joints

4 to 6 channel radio system capable of mixing ailerons and elevators (elevon/taileron/ailervator) or an external elevon mixing unit.

Optional Aileron version:

- 3/8" X 1/2" balsa (aileron spar and aileron leading edge)
- Hinging material such as Sig Easy Hinges to hinge ailerons
- External servo reverser if your radio system doesn't include this type of mixing
- Aileron control linkage

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