



Cessna 180



Herr Engineering Corp. HRR305



ASSEMBLY INSTRUCTIONS

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

COMPLETE KIT PARTS LIST

Wood Bag:

1 LC-510-01	3/32x4x24 Laser Cut Balsa Sheet	1 LC-510-02	3/32x4x24 Laser Cut Balsa Sheet
1 LC-510-03	3/32x4x24 Laser Cut Balsa Sheet	1 LC-510-04	3/32x4x24 Laser Cut Balsa Sheet
1 LC-510-05	3/32x4x24 Laser Cut Balsa Sheet	1 LC-510-06	1/8x4x24 Laser Cut Balsa Sheet
1 LC-510-07	1/8x4x24 Laser Cut Balsa Sheet	1 LC-510-08	1/16x4x12 Laser Cut Balsa Sheet
1 LC-510-09	1/16x3x12 Laser Cut Birch Ply Sheet	1 LC-510-10	3mmx6x12 Laser Cut Poplar Ply Sheet
1 LC-510-11	3mmx6x12 Laser Cut Poplar Ply Sheet	2 Leading Edge	1/4 sq.x24 Balsa Strip
4 Leading Edge Stringers	1/8 sq.x24 Balsa Strip	2 Wing Tips	3/4 Balsa Triangle x4.5
8 Trailing Edge	1/16x1x14 Balsa Sheet	2 Trailing Edge	1/16x1x3.5 Balsa Sheet
4 Center Section Sheet	1/16x3x18 Balsa Sheet	2 Control Surface Pushrod	1/16x18 Wire, Threaded One End
1 Throttle Pushrod	1/16x12 Wire, Threaded One End	1 Braces	3/32x3/16x8 Balsa Strip
4 Main Spars	1/8x1/4x24 Balsa Strip	4 Main Spars	1/8x1/4x13 Balsa Strip
2 Center Section Spars	1/4 sq.x3.5 Balsa Strip	2 Wing Strut	3/32x1/4x12 Balsa Strip

Misc. Parts Loose in Box:

1 Plan Sheet A		1 Plan Sheet B	
1 Instruction Book		1 Decal Sheet	
2 Main Landing Gear	7.625	1 Plastic Cowl	
1 Clear Plastic	.010x3x6		

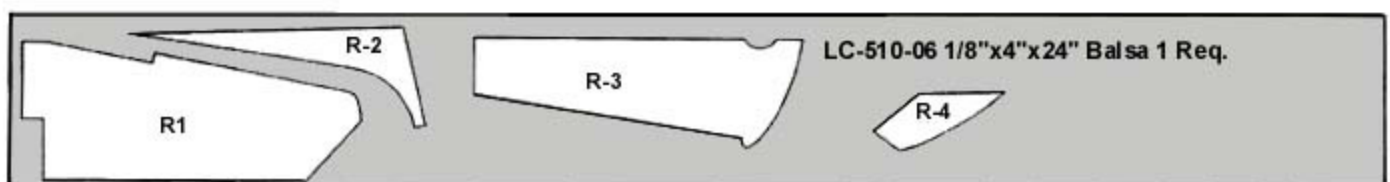
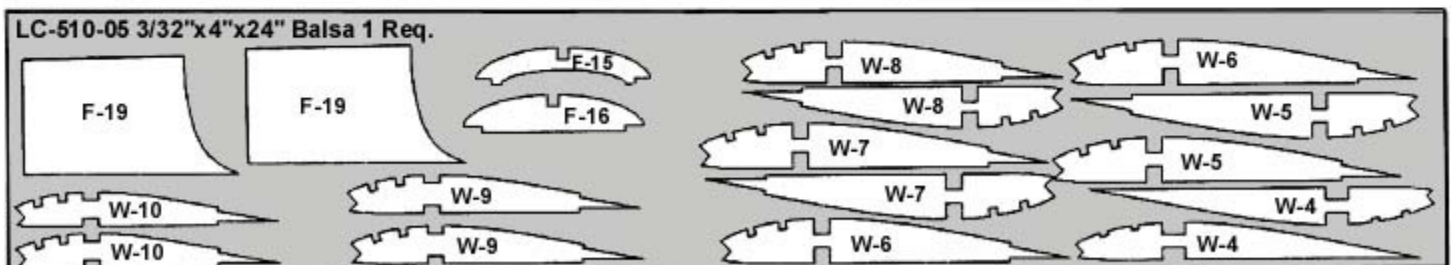
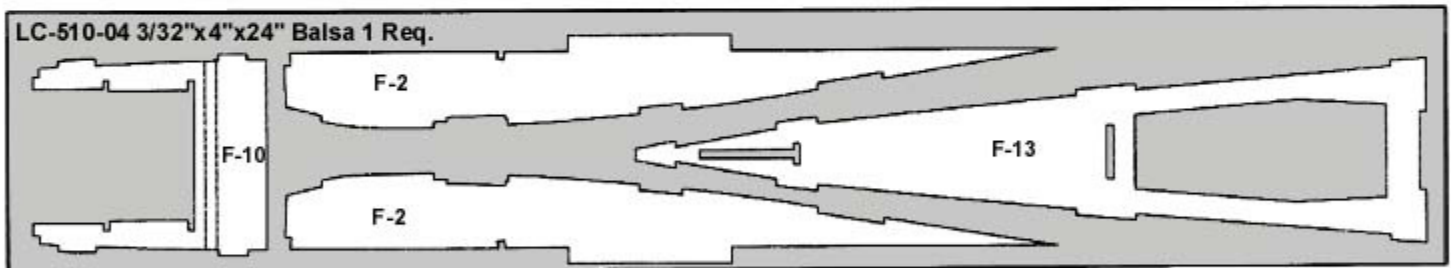
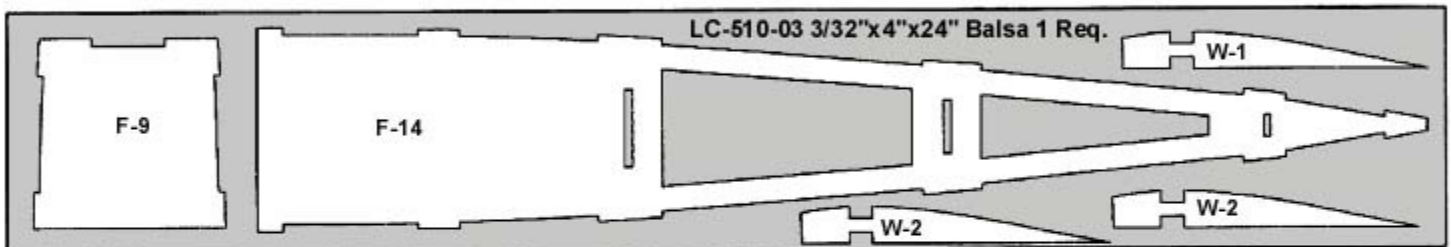
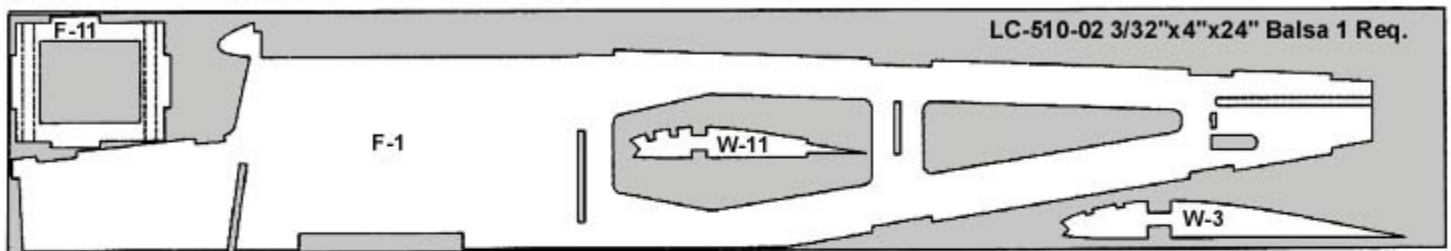
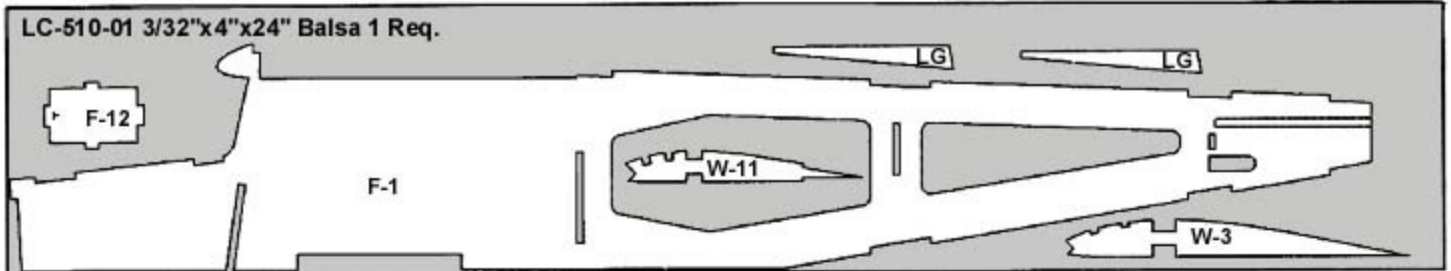
Hardware Bag:

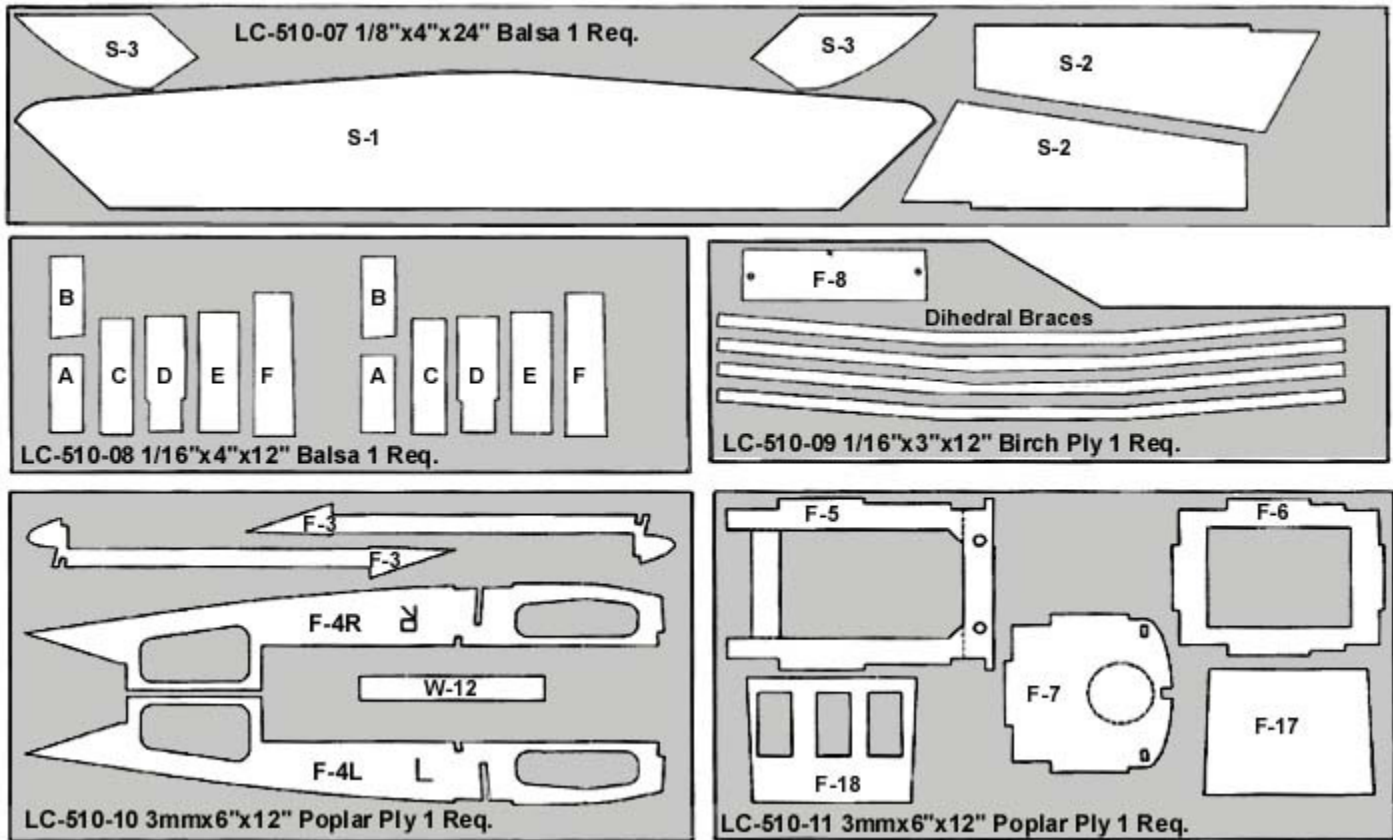
1 Left Hand Control Horn	Small Nylon Control Horn	1 Right Hand Control Horn	Small Nylon Control Horn
4 Horn Screw	2-56x3/8 Machine Screw	1 Elevator Joiner	1/8x3 Birch Dowel
8 Main Landing Gear & Cowl Screw	#2x3/8 Sheet Metal Screw	3 Nylon Clevis	Small Nylon Clevis
1 Nose Center Brace	3/16 sq.x3 Balsa	2 Wing Bolt Plates (F-20)	3/16 Laser Cut Ply
2 Wing Bolt Fillers	3/16 Tapered Balsa Wedge	1 Tail Wheel Wire	1/16 dia.x3 Music Wire
2 Wing Dowels	3/16x3/4 Birch Dowels	2 Wing Bolts	10-32x1 Nylon Bolts
4 Strut Wires	1/16x1.25 Mild Steel Wire	1 Strut Tubes	1/8x2 Plastic Tube
2 Landing Gear Straps	1/4x3/4 Nylon Strap	1 Tail Wheel Retainer	Black Nylon Retainer

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.

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.

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





Additional Items Required (Not Included in Kit)

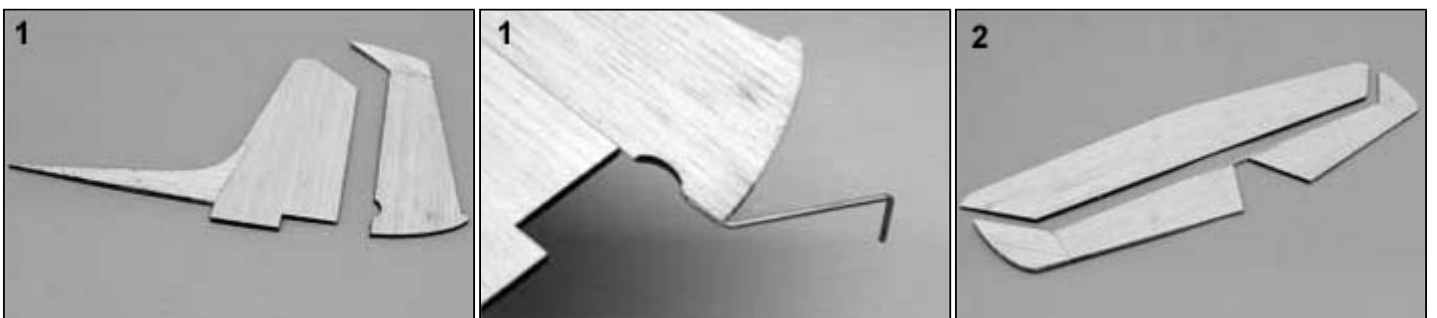
Note: These are parts that we have used and are familiar with. There are many other brands available and you may substitute other items that you are more comfortable with or have on hand.

1	Engine	.049 to .061 Engine with throttle	1	Radio	3 Channel Radio with Mini servos
3	Hinges	Sig Easy Hinges #SH-710	3	Pushrod Connectors	Sig #SH-736
2	Covering Material	2 Rolls Iron on covering material	2	3/32 Wheel Collars	Sig #SH-585
1	1/16 Wheel Collar	Sig #SH-584	2	Main Wheels	2 Du-Bro #200TL
1	Tail Wheel	3/4 Sullivan #351 T1 Tail Wheel	2	Wheel Bushings	Make from K&S Brass Tube #127
1	Motor Mount	Dave Brown #0506	4	Motor Mount Screws	4-40 x 3/4 Machine Screws and Blind Nuts Sig #SH-111
1	Fuel Tank	Sullivan 2oz. #SS-2	1	1/2-A Fuel Line	Sig #SH-288
1	Propeller	Grish Tornado 6-3 Nylon Propeller #GRIQ1050			

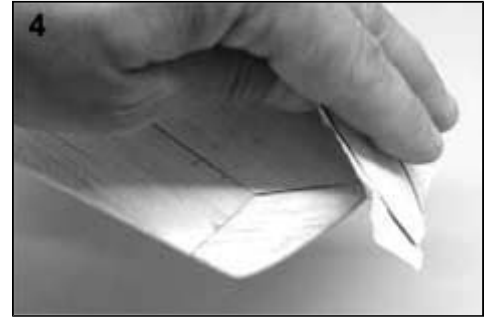
General Note: Cover the plans with wax paper before assembling your model to prevent the parts from sticking to the plan.

Building the Tail Surfaces

- Join R-1 and R-2 together over the plan to make the fin. Join R-3 and R-4 together over the plan to make the rudder. Temporarily hinge the rudder to the fin. Do not glue the hinges at this time. Bend the tail wheel wire to shape and glue it into position into the bottom of the rudder.
- Join S-2 and S-3 together over the plan to make the elevators. Join the elevators using the 1/8 dowel. Use the plan and the stabilizer as a guide. Trim the dowel as required to achieve the proper length.

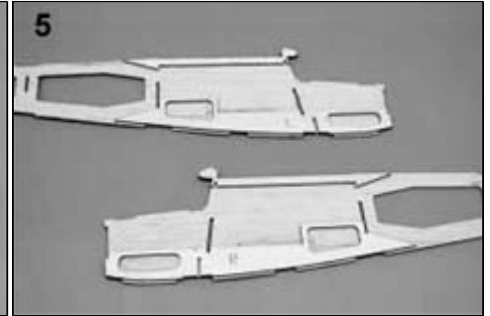
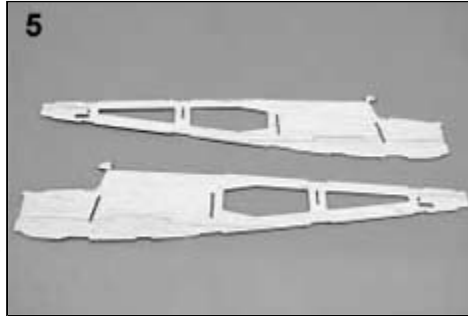


- Temporarily hinge the elevators to the stabilizer. Do not glue the hinges at this time.
- Sand the tail surfaces smooth and round all of the edges except the bottom edge of the fin.

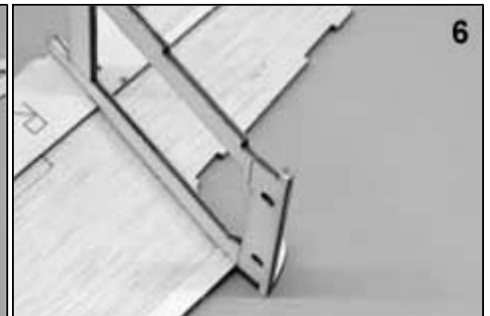
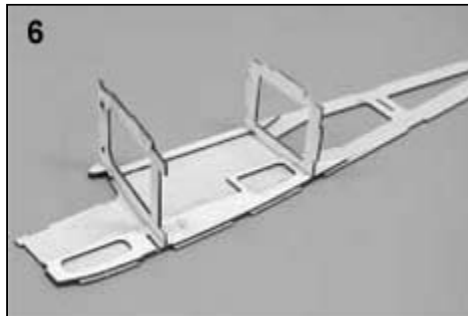


Building the Fuselage

- Assemble the fuselages side by gluing parts F-1 and F-2 together. Parts F-3 and F-4 are glued on the inside of the fuselage. Parts F-4 are marked with an L or R for the left and right side. Be sure to make a left and a right side.

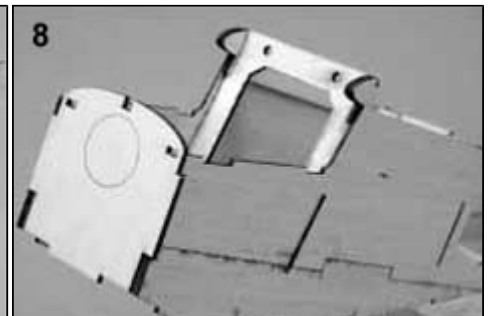
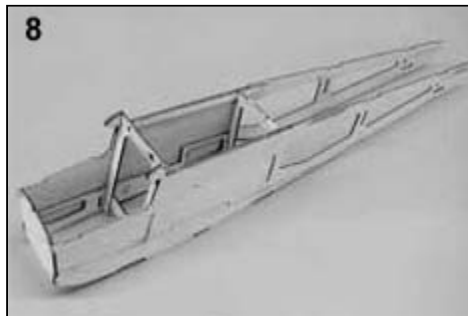


- Cut part way through the top of former F-5 at the dashed lines and gently crack it at these locations to allow the top to angle forward. Place the right fuselage side on the building board and place formers F-5 and F-6 into position. These formers should be 90 degrees to the fuselage side. Glue the formers to the fuselage side.



- Glue the left fuselage side into position on the formers. The formers should also be 90 degrees to this fuselage side.

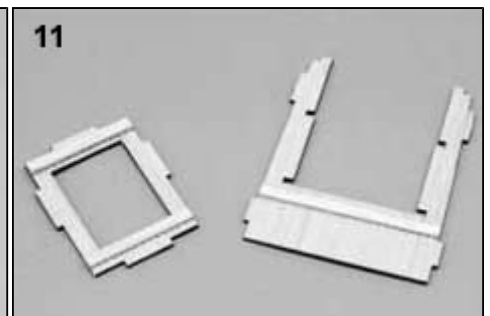
- Gently squeeze the front of the fuselage together and glue former F-7 into position.



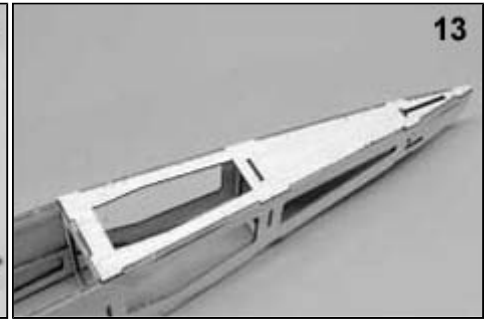
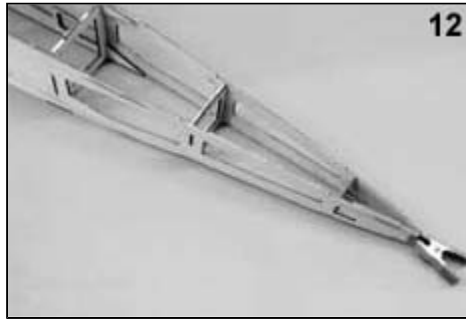
- Glue the plywood landing gear support F-8 into position with the marking X at the front and facing the toward the outside of the fuselage.

- Remove the cross brace at the bottom of F-5 by cutting through the two dashed lines at the ends of the cross piece. Now apply glue to the cracks in the top of former F-5.

- Glue two strips of 3/32 x 3/16 balsa strip across the front of former F-11 to brace it as shown on the plan. Also, glue one strip to part F-10 as shown on the plan.



12. Gently squeeze the aft end of the fuselage sides together and hold with two clothes pins or a small clamp. Place the formers F-11 and F-12 into position and glue them to the fuselage sides. Glue the aft end of the fuselage sides together making sure that the joint is straight and not leaning to the left or right.



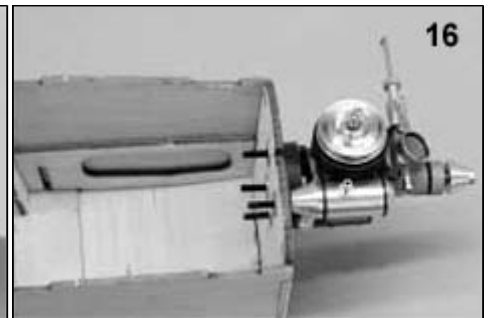
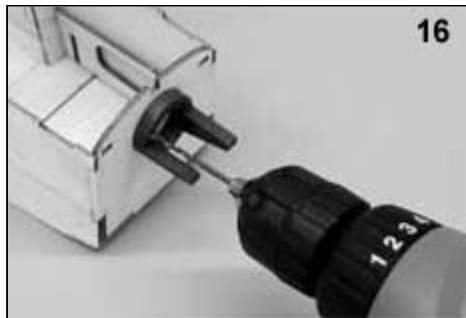
13. Place part F-13 into position and glue it to the center of formers F-6, F-11, and F-12. Working from the front to the rear, gently pinch the fuselage sides into contact with F-13 and glue together.



14. Place part F-14 into position and glue it to the center of formers F-5, F-11, and F-12. Now working from the front to the rear, gently pinch the fuselage sides into contact with F-14 and glue together. The front end should rest on and be glued to F-8.

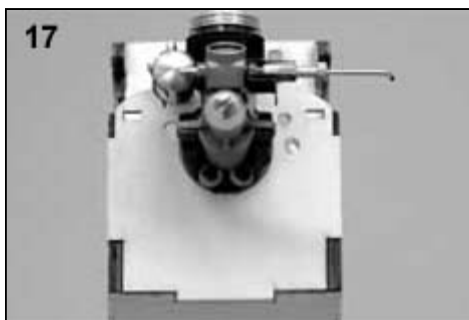
15. Glue F-9 to the forward bottom of the fuselage between F-7 and F-8.

16. Mark and drill 1/16 holes in F-7 for the motor mount. Attach the motor mount to the firewall with 4-40 screws and blind nuts. Now install the motor on the mount. The back of the muffler should be 1/32 away from F-7.



17. Mark and drill 3/16 holes in the firewall for the throttle pushrod, fuel, and vent lines.

18. Glue the F-19 fuel tank support into position. Now assemble the fuel tank and install into the model. Cut the motor mount screws off flush with the back of F-7 so they do not interfere with the fuel tank.

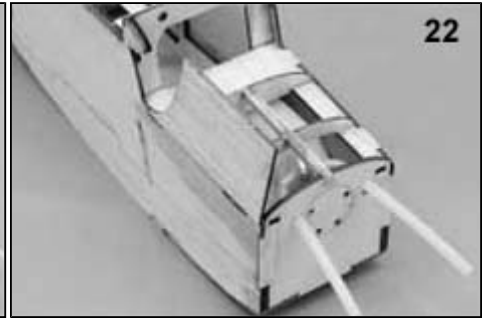
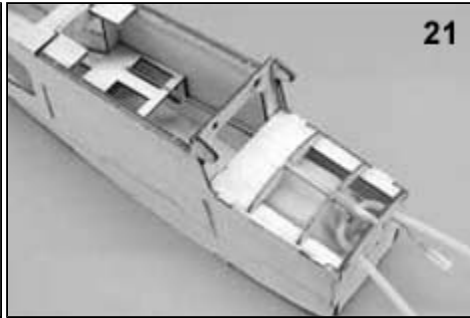
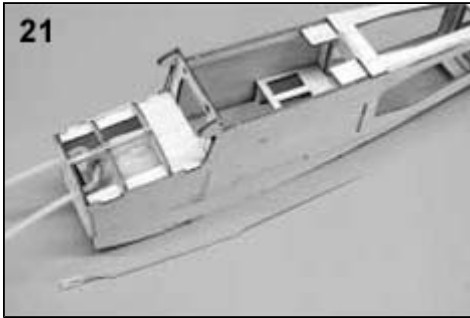


19. Fit part F-18 to the fuselage and glue into position and glue both F-20s into position at the top of the fuselage sides and the front of F-6.

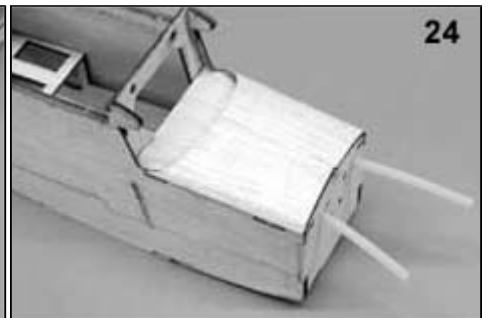
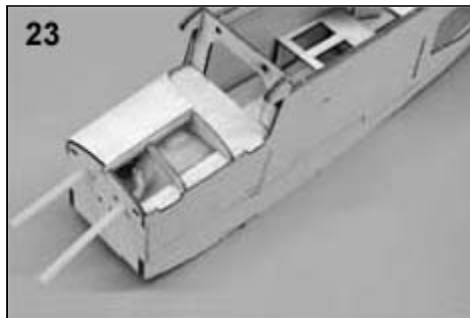
20. Glue parts F-10, F-15 and F-16 into position at the nose of the model. Now glue the 3/16 sq. strip into position between F-7 and F-16.



21. Bend and test fit the throttle pushrod into position. Then remove from the fuselage until needed later.
22. Glue one of the F-19 pieces into position. First, apply glue to the lower edge only and attach F-19 to the top edge of the fuselage side. When the glue is dry, thoroughly wet F-19 with an ammonia based cleaner such as Sig's Pure Magic Airplane Cleaner and let it soak in for about 10 minutes.



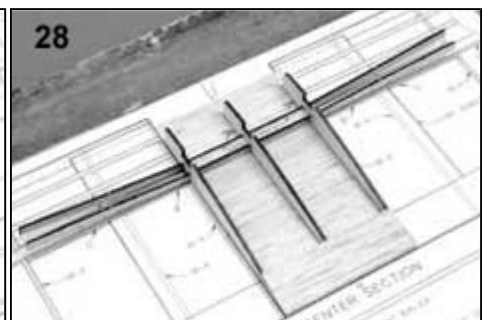
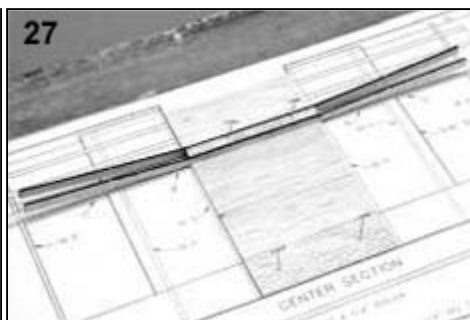
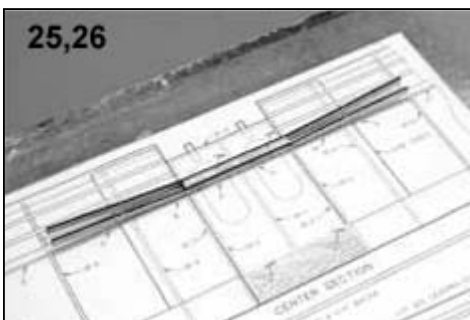
23. Now gently roll F-19 down into position on formers F-7, F-15, and F-16. Hold in this position until the moisture dries. Mark F-19 at the centerline of the 3/16 sq. strip and trim with your hobby knife. Now glue F-19 to F-7, F-15 and F-16.



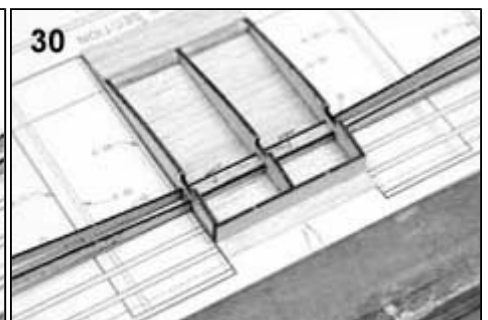
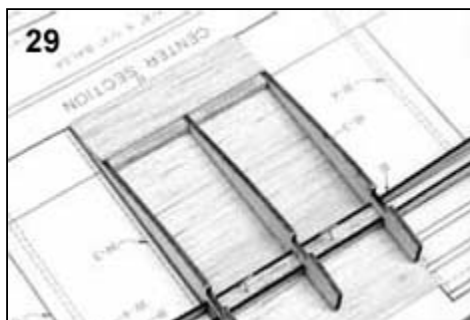
24. Now repeat this operation to install the opposite F-19. Now set the fuselage aside until needed later in construction.

Building the Wing

25. Cut the lower 1/4 sq. main spar and the 1/16x1 trailing edge for the center section to length & pin into position on the plan.
26. Glue the two lower plywood dihedral braces to the front and back of the lower spar.
27. Cut and fit the forward and rear lower 1/16 sheet for the center section. The front piece is trimmed slightly long and is glued to the front face of the forward dihedral brace. The rear piece is glued to the rear face of the rear dihedral brace and the 1 trailing edge.
28. Glue ribs W-1 and W-2 into position on the lower spar and lower sheet. These ribs should be 90 degrees to the building board. Glue the top 1/16 x 1 trailing edge into position.

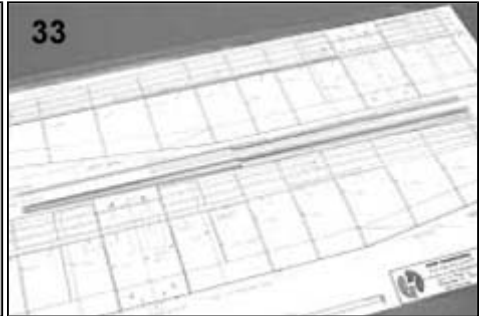
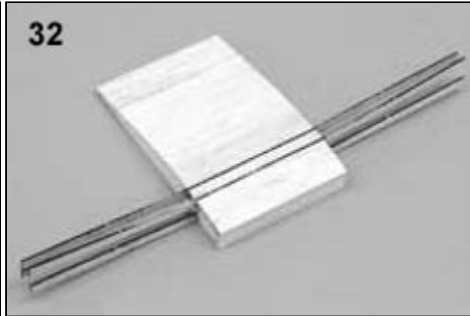
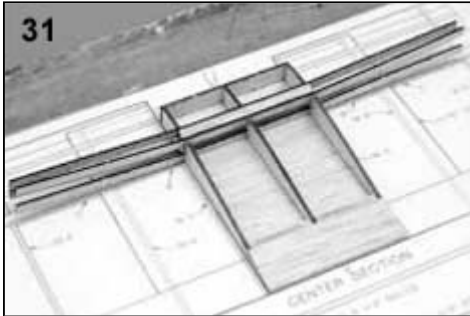


29. Glue the two tapered filler strips into position between the top and bottom trailing edges on either side of the center W-1 rib.

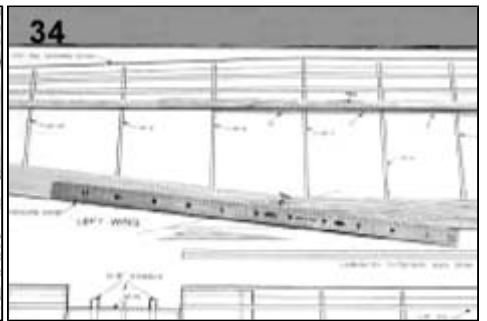
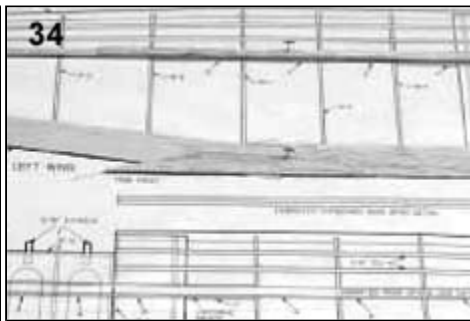
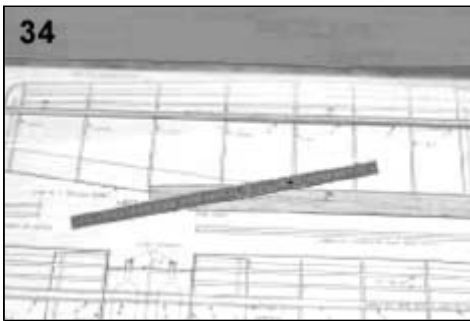


30. Glue part W-12 into position on top of the lower 1/16 sheet and against the W-1 and W-2 ribs.

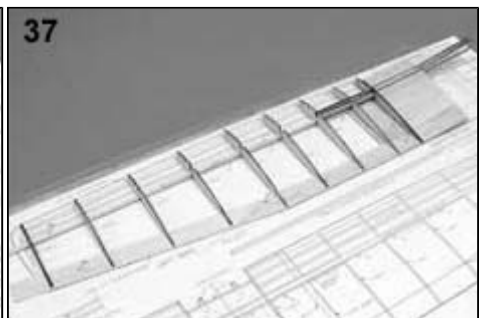
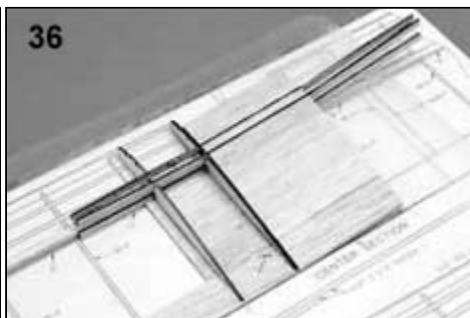
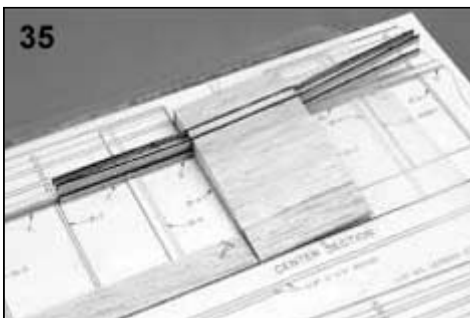
31. Cut the forward top 1/4 sq. main spar to length and glue the two remaining dihedral braces to it as you did the lower spar. Now glue the spar into position. Now glue the two shear webs A into position against the rear of the spars.
32. Glue the remaining sheet to the top of the center section. The forward sheet is glued to the top of W-12 and against the front face of the dihedral brace on the main spar. The rear sheet runs from the aft face of the main spar and the 1 trailing edge. Now remove the center section from the plan. and trim the top and bottom sheet flush with the front of W-12.
33. Laminate the four main wing spars from 1/8 x 1/4 balsa strips as shown on the plan. Pin the left hand lower outboard main spar and the lower left trailing edge into position on the plan. The inboard ends should terminate between W-2 and W-3. The outboard ends can be left long and be trimmed flush with the last rib after assembly.



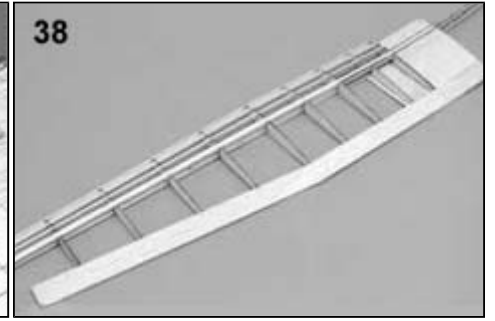
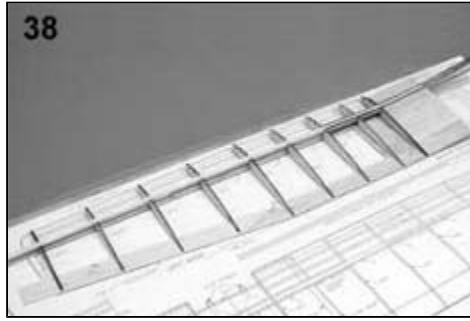
34. Trim the ends of the 1/16 x 1 trailing edges (where they meet at W-7) to the angles shown on the plan. Glue the trailing edges together over the plan. When the glue is dry, trim the outer piece to match the plan. Assemble the three remaining trailing edges as you did the first.



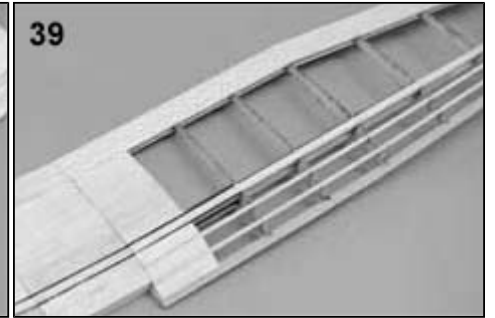
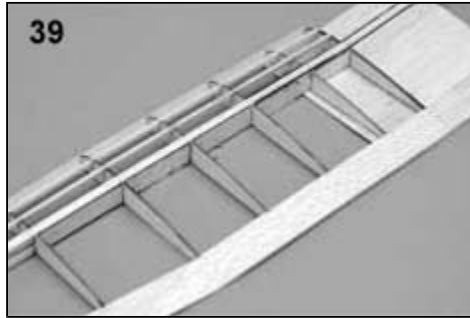
35. Place the wing center section into position against the left lower spar and trailing edge. Rock the center section so that the dihedral braces are in contact with the lower spar and are flat on the building board. Glue the dihedral braces to the outboard main spar and glue the trailing edge to the center section.
36. Glue the lower 1/16 sheet into position between the lower spar and the 1 lower trailing edge. Now glue ribs W-3 and W-4 into position. Rib W-3 should be tight against Rib W-2 of the center section.
37. Glue the remaining ribs (W-5 thru W-11) into position. These ribs are to be 90 degrees to the building board.



- 38 Glue the top main spar into position. The inboard end should make contact with the top spar in the center section. Glue the 1/4 sq. leading edge into position on the ribs. The outboard end can extend past the last rib and be trimmed later. Glue the top 1/16 x 1 trailing edge into position. Glue the 1/8 sq. leading edge strips into position.

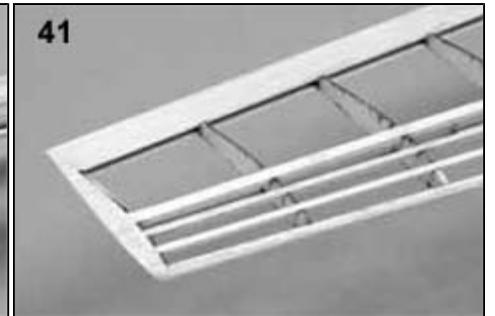
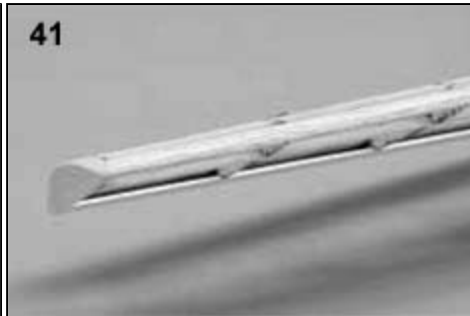
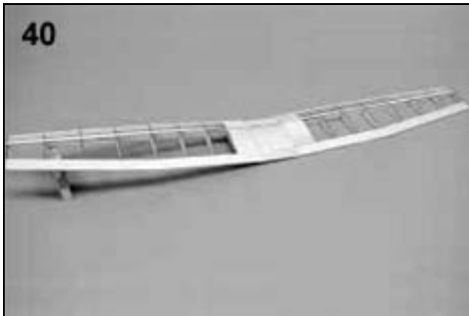


- 39 Remove the wing from the plan. Sheet the forward bottom of the wing with 1/16 sheet. Glue the shear webs B thru G into position on the rear of the main spar. Now sheet the top inboard end of the wing. Trim any parts that extend past W-11 flush with the outboard face of W-11.

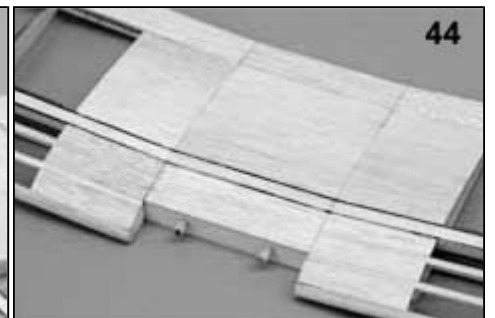


40. Now build the right wing as you did the left. When you place the center section / left wing into position you should support the left wing at the proper angle so that the dihedral braces for the right wing are flat against the building board.

41. Glue the 3/4 balsa triangle wing tips into position. Trim and sand the wing tips to match the airfoil shape of rib W-11. Now sand the leading edges round and sand the wing smooth all over.



42. Test fit the wing onto the fuselage. You can sand the front of W-12 or the trailing edge if the fit is too tight. If there is any gap between the leading edges of the outboard panels and the fuselage you can glue a piece of 1/16 sheet to the outside of the W-3 rib and sand it for a perfect fit.



43. Use a 3/16 drill bit to drill through the holes in F-5 and into the wing leading edge (W-12).

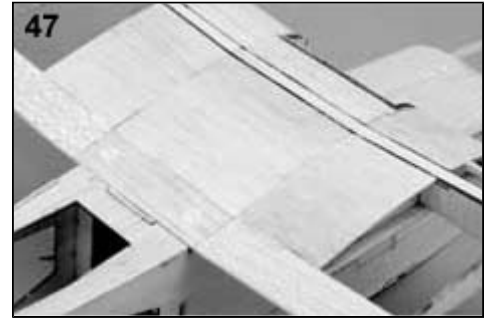
44. Remove the wing from the model and glue the two wing dowels into position. They should stick out from W-12 about 1/4.

45. Place the wing back on the model and mark the position of the rear hold down screws using the plan as a guide. Drill these two holes with a 1/8 drill bit. Drill all the way through the trailing edge and parts F-20.



46. Remove the wing and drill out the holes IN THE WING ONLY with a 3/16 drill bit.

47. Squirt some thin C/A into the 1/8 holes in the F-20 s. Run a 10-32 tap down through the holes to cut the threads for the screws. Put a little more thin C/A onto the threads and then clean them out one last time with the tap.

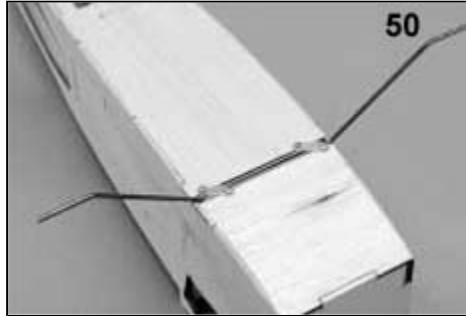


48. Mount the wing back on the model and bolt into place with the nylon screws.

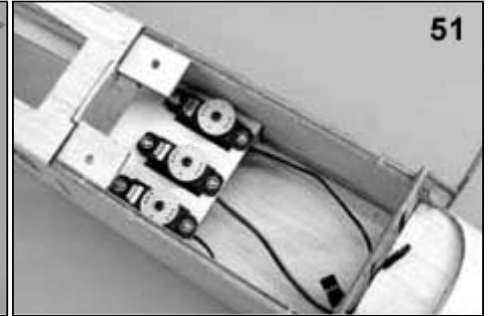
Pre-Cover Assembly

49. Sand the entire fuselage smooth and lightly round the corners.

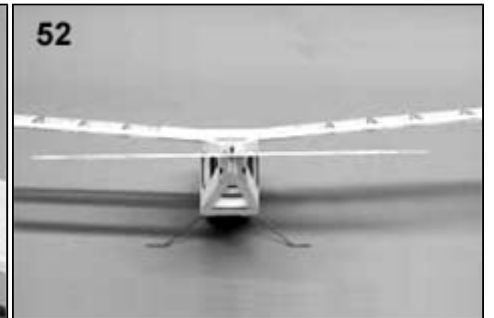
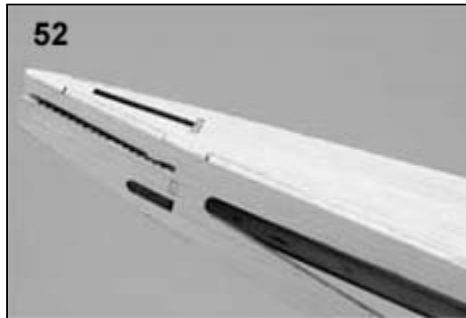
50. Install the main landing gear wires into the fuselage and secure with the landing gear straps and #2 sheet metal screws.



51. Mount the servos on F-18. Install them according to the radio manufactures instructions. You may trim the openings in F-18 as needed to allow the servos to fit.



52. Trim the wood from the rear of the stabilizer slot. Bolt the wing back on the model. Now glue the stabilizer into position on the model. Sight from the rear to make sure that the stabilizer is aligned properly with the wing. It should not tilt to one side or the other.



53. Now glue the fin into position. It should be 90 degrees to the stabilizer. Make sure it is straight and square before gluing.

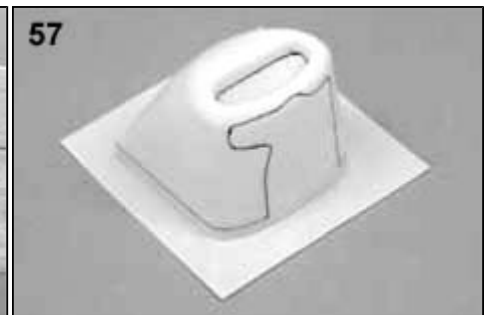
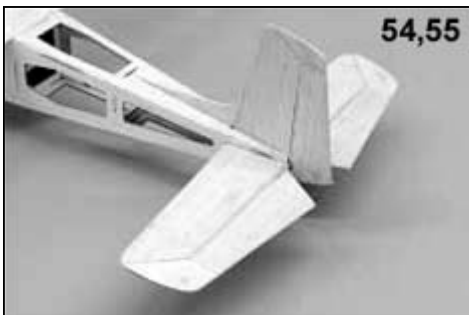


54. Temporarily hinge (do not glue) the elevators to the stabilizer.

55. Temporarily hinge (do not glue) the rudder to the fin.

56. Attach the control horns to the elevator and rudder with 2-56 screws. Bend and install the rudder and elevator pushrods with clevises at the horns and servo connectors at the servos.

57. Trim the plastic cowl as shown. The rear of the cowl has been trimmed to length at the factory so you will only have to cut out the opening in the front and make the cutout to allow clearance for the engine, muffler, and carburetor.



58. Install the motor and mount. Test fit and install the cowl using four #2 sheet metal screws.
59. Cut the plastic windshield to match the pattern on the plan and test fit it to the model. Do not glue into position until after the model is covered.



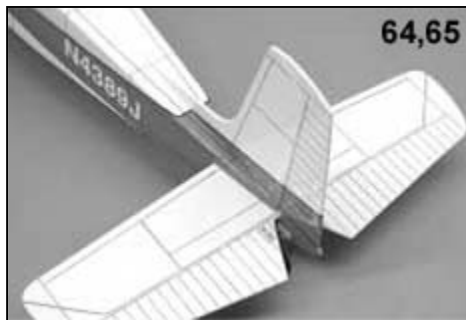
Covering

60. Remove the Cowl, motor, motor mount, control surfaces, landing gear, and other items. Sand the entire model smooth with 320 grit sandpaper.
61. Cover the model with your choice of iron on covering materials.
62. An ultra fine Sharpie Marker can be used to draw panel lines and other details.
63. Paint the firewall and cowl with fuel proof paint.

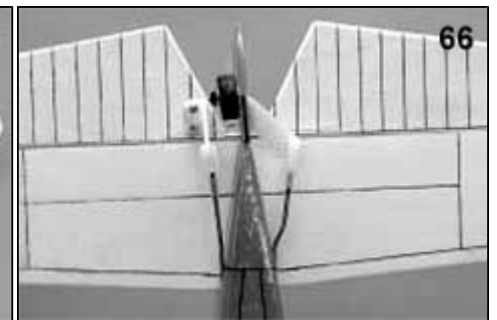
Final Assembly

64. Put the tail wheel on its axle and secure by pressing on the nylon retainer.

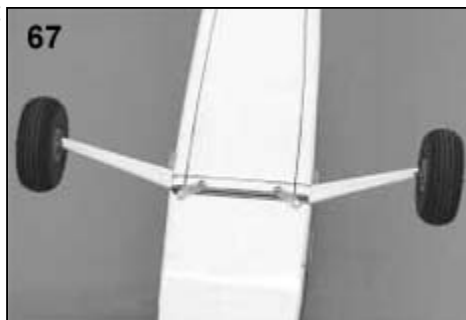
65. Install the elevators and then the rudder to the model and glue the hinges in place.



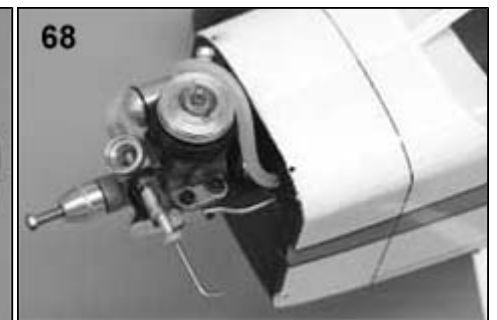
66. Install the control horns. Install the pushrods and connect the pushrods to the servos and horns.



67. Install the landing gear. Cover parts LG. Attach to the wire strut with a strip of covering material. Apply a small amount of silicone rubber to attach them to the fuselage side. Secure the wheels to the axles with 3/32 wheel collars.

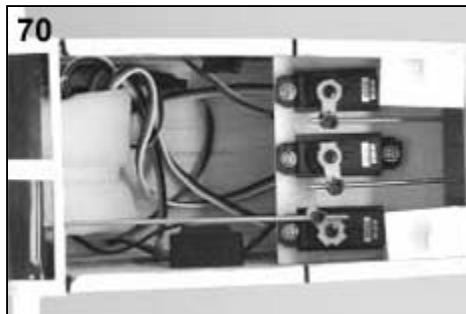


68. Install the engine mount to the firewall and bolt the engine to the mount.



69. Install the throttle pushrod.

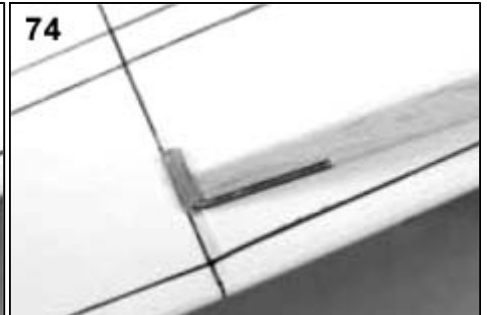
70. Install the receiver and battery pack. The battery should be placed in the nose of the model under the fuel tank. Wrap the battery and receiver with foam rubber. Mount the switch in the left fuselage side. Run the receiver antenna through the rear fuselage and out a small hole in the fuselage side just behind F-12 and below the stabilizer.



71. Install the windshield on the model. First glue the top rear edge to the top of F-5. When this glue is dry, use small strips of masking tape to hold the bottom corners in position and carefully glue the remaining edges of the windshield to the model.



72. Install the cowl on the model using the #2 sheet metal screws and securely attach the propeller.
73. The wing struts are optional. They are installed using the following procedures. Sand the edges of the strut round. Bend one of the strut wires and glue to one end of the strut.
74. Cut the plastic strut tube into four 1/4 lengths. Mark the strut locations on the model using the plan as a guide. Carefully remove a 1/16 x 1/4 strip of covering at the tube mounting locations. Now glue the strut tubes to the model.



75. Mount the wing on the model. Attach the strut to one of the wings by sliding the wire into the tube. Now swing the strut against the fuselage side and cut it off so that there is about 1/8 between the end of the strut and the tube on the fuselage. Now attach the lower strut wire to the strut. Build the other strut and finish them with covering material.



76. Balance the model at the location shown on the plan. If necessary, add weight to the nose or tail until the model is balanced with the fuel tank empty. Set the control throws to the measurements shown on the plan and verify that the controls move in the proper direction.
77. Always pre-flight your model thoroughly before each flight. It is your responsibility to verify that your model is airworthy. Always follow established safety guidelines and manufacturer s recommendations while starting and operating the engine, radio, and when flying the model.

WARRANTY

Herr Engineering Corp. guarantees this kit to be free from defects in both materials and workmanship at the time of purchase. This warranty does not cover any component damaged buy use or modification. In no case shall Herr Engineering Corporation's liability exceed the original cost of the purchased kit. Further Herr Engineering Corp. reserves the right to change or modify this warranty without notice.

In that Herr Engineering Corporation has no control over the assembly or use, no liability shall be assumed or accepted for any damage resulting from the use by the user during construction of the kit or the use of the final user assembled product. By the act of building this kit and/or using the final user assembled product, the user accepts all liability.

If the buyer and/or user is not prepared to accept all of the liability associated with this product, he is advised to immediately return this kit in new and unused condition to the place of purchase for a full refund.

LIMIT OF LIABILITY:

In use of our products, Sig Mfg. Co.'s only obligation shall be to replace such quantity of the product proven to be defective. User shall determine the suitability of the product for his or her intended use and shall assume all risk and liability in connection therewith.