

KILLER CHAOS

The Killer Chaos is not difficult to build if you follow the instructions carefully. Read and understand each step so that you understand what you are going to do. It is necessary to follow the building sequence as described in the instructions, so pay attention as you build. If the instructions are carefully followed you should end up with a straight, strong, and excellent flying aircraft.

Recommended adhesives are thin and thick C/A glue, 5 minute epoxy, and aliphatic resin (amber colored) woodworker's glue. 3M 77 spray contact cement is also very useful for making sandpaper blocks and for tack gluing various pieces together during construction. Five minute epoxy thinned with a small amount of rubbing alcohol is recommended for sealing the engine and tank compartment before the final covering and finish are applied.

To make sure all parts, such as the leading and trailing edges, empennage, and control surfaces, get sanded evenly and straight, make up a couple of sanding blocks approximately twelve to eighteen inches long, and two to three inches wide. There are several commercial aluminum sanding blocks available that are real nice. Sandpaper can be attached with 3M 77 spray contact cement which can be easily removed by using a heat gun when the paper becomes worn to the point where it needs replacing.

There are many ways of building a tapered wing, such as featured on this model, and having it turn out warp free. The method described herein has been used successfully many times and has consistently resulted in warp-free wing panels. However, if you believe your pet method is better, by all means use it.

Take your time and do it right and you will end up with a superbly flying aircraft of which you can be very proud.

WING CONSTRUCTION

The bottom surface of the left hand wing panel is built first, the landing gear blocks are installed, the sheeting is glued in place and the cap strips are added before removing the panel from the building board. The panel is then removed, blocked up, and the top surface wing sheeting and cap strips are added. The right hand panel is built by making the wing drawing transparent and then building the panel as the reverse of the first. This method assures the wing panels match and are built warp-free. The airfoil is symmetrical, and each panel is tapered along both its longitudinal axis (span wise) and its horizontal axis (chord wise). The following instructions are for building directly over the wing plan and, if carefully followed, will result in a straight, warp free, wing.

Pre-construction:

1. Draw a center line on each wing rib through the leading and trailing edge slots with a soft lead pencil. This will be used during wing construction to assure that the wing ribs are aligned parallel with the building surface.
2. Check rib spar notch fit using the spars. The top of the spar needs to be flush with the edge of the rib.
3. Locate the two 1/4 inch by 1 inch trapezoidal leading edges and draw a center line on both sides along the longitudinal axis.
4. Place the plans on a suitably sized, flat, warp-free, work surface and place a sheet of waxed paper over the wing plan.
5. Add cutouts and plywood doublers for landing gear grooved blocks to the ribs according to the plan and your choice of either tricycle or taildragger configuration. Use the spar notches to measure and locate the doublers so that their notches are parallel with the spars. The plywood will have to be trimmed to suit the block location and rib curvature. Be sure that you locate the doublers so that the smaller of the grooved blocks will be epoxied to the plywood and not to the balsa rib.
6. Bevel the 1/4 inch square trailing edge to fit the contour of the trailing edge of the ribs.
7. Make 11 blocks out of scrap wood approximately an inch square and 1/2 inch thick to be used for aligning the wing ribs parallel with the building board during wing construction.

LEFT HAND PANEL CONSTRUCTION

1. Locate and pin the 3/8 inch by 1/2 inch bottom main spar over the plans.
2. Locate each wing rib in position on the spar.
3. Using the 1/2 inch thick blocks (prepared in Preconstruction note #7 above) as wedges for the rear portion of the wing ribs, carefully align the center line of each rib so that it is parallel with the building board.
4. Assure the surface of each rib is perpendicular to the work surface, then add the beveled 1/4 inch square trailing edge and allow time for its adhesive to set up.
5. Install the top 3/8 inch x 1/2 inch spar to the ribs assuring that the rib surfaces remain perpendicular to the work surface.
6. Using slow C/A glue, install the 3/32 inch x 7/8 inch trailing edge sheeting to the ribs and the 1/4 inch square trailing edge.
7. Glue all of the ribs in place on the spars.
8. Add the 1/4 inch x 1 inch trapezoidal shaped leading edge to the wing ribs, aligning the center lines previously drawn with the rib slots.
9. Locate the grooved hardwood landing gear blocks. There are two long ones and two short ones. The short one will be glued to the long block and to the plywood doubler on the appropriate rib as shown on the wing drawing.
10. Epoxy a long grooved landing gear block in position in the rib notches with the groove facing up. The top surface of the block is to be 3/32 inches above the rib surface to allow the landing gear block to be flush with the center section sheeting and cap strips when they are installed.
11. Trim the top of the small grooved block so that it fits snugly against the long block and the plywood doubler.
12. Carefully align the small block with the edges of the long block and epoxy it to the long block and the plywood. The hole for the landing gear wire to pass through the long block will be drilled after the structure is removed from the building surface and before the top wing sheeting is glued in place.
13. Bevel the leading edge sheeting for a good fit at the rib/leading edge juncture.
14. If you have chosen the taildragger configuration, put the leading edge sheeting in place and mark it for clearance of the grooved landing gear block, then carefully cut out the slot so that you maintain a close fit.

15. Add the leading edge sheeting using gap filling (slow) C/A adhesive.
16. Add the center section sheeting.
17. Add the cap strips.
18. Remove the wing panel from the building surface and make sure all glue joints are secure and the wing sheeting is firmly attached to each rib.
19. Using a #20 drill bit (.160) and the vertical grooved block as a guide, drill the hole through the grooved block for the landing gear wire.
20. Relieve the corner at the hole and groove juncture on the long block so that the horizontal portion of the 5/32 inch diameter landing gear wire will lie flat in the gear block. Adjust the angle of the gear wire and the relief radius to assure that the gear lies flat in the long gear block.
21. Turn the wing over, place it on the building surface, and once again using the 1/2 inch thick blocks, realign it so that the center lines on the ribs are once again parallel with the building surface.
22. Add the top leading edge sheeting. **Hint:** One of the better ways we have found to assure that the final sheeting is securely attached to the ribs when working in the blind is to lightly coat the ribs with carpenter's glue (aliphatic resin), then place the sheeting on the ribs to transfer the glue location. Remove the sheeting and make sure the glue is continuous on each of the ribs and let the glue dry. When the glue feels dry (timing is not critical), locate the sheeting in place and attach it to the leading edge and the spar with gap filling C/A glue. Now, using a heat sealing iron set at high heat, slowly press the sheeting onto the ribs. After the wood cools, the sheeting will be firmly attached to the ribs.
23. Add the 3/32 inch x 7/8 inch trailing edge sheeting making sure that the trailing edge is perfectly straight in both directions.
24. Fit and add the center section trailing edge balsa filler wing bolt blocking.
25. Add the top center section sheeting and the rib cap strips.
26. Remove the panel from the building surface and set it aside for now.
27. The right hand panel is built on the reverse side of the plans using the same process as the left hand panel. The plans can be made transparent by treating them with a light coating of any kind of light oil or a K&E drafting fluid called Translux. Vegetable or mineral oil used in very small amounts works well and, since the plans are covered with waxed paper during the building process, the small amount of oil residue does not affect the integrity of the glued joints.

28. After completing both wing panels, trim the ends flush and sand the leading edge to shape.
29. Add the 3/8 inch hardwood leading edge blocking for the front wing dowel to the center section rib of one of the panels as shown on the plans.
30. Make the cutout for aileron servo installation in the 3/8 inch balsa center section rib and install it as shown on the plans.
31. Add the 3/8 inch wing dowel at the leading edge of the selected panel.
32. After all of the adhesives have set up, join the left and right hand panels making absolutely sure their center lines match perfectly and the top surface of the wing is flat. The taper of the bottom of the wing provides the dihedral for the wing.
33. Add the wing tip blocks and sand to shape.
34. Add the aileron horns as shown on the plans.
35. Add hinge slots in the wing trailing edge. Use a minimum of four hinges for the ailerons.
36. Sand leading edge of the ailerons to a V shape.
37. Add hinge slots to the ailerons and temporarily install ailerons to the wing. Check for minimum gap.
38. Remove ailerons and hinges
39. Sand the wing smooth and add 4 oz fiberglass to the center section 3 inches each side of the center line. Cover the bottom first and after the adhesive cures, cover the top. We prefer using C/A for this because it turns a rather messy and tedious job into one of about 30 minutes, which includes cutting the cloth. Additional bonuses are that there is no fiberglass dust during sanding and the edges easily feather into the balsa sheeting with a minimum of sanding. **Caution: Be sure to do this in a well ventilated area.**
40. Cut out aileron servo well and add plywood strips and blocking for servo mounting.

THIS COMPLETES CONSTRUCTION OF THE WING

TAIL SURFACES CONSTRUCTION

HORIZONTAL STABILIZER AND ELEVATORS:

1. Locate the 3/8 inch by 1 inch, 3/8 inch by 3/4 inch, 3/8 inch by 1/2 inch, and 1/4 inch by 3/8 inch balsa sticks used for construction of the horizontal stab.
2. Put the plans on the work surface and place a piece of waxed paper over the horizontal stab and elevator plan view.
3. Using pins, assemble the horizontal stab over the plan view.
4. After assembly, apply slow C/A to all joints.
5. Notch the elevator leading edges for the 5 inch long 3/8 inch dowel joiner.
6. Place a piece of plastic wrap about 12 inches long at the mid-point over the top of the stab letting half of it hang out past the trailing edge.
7. Place the elevators over the plastic wrap and up against the stab trailing edge so that the wrap is in between the two. Pin to the work bench surface.
8. Trim the 3/8 inch dowel and elevator notch so the dowel fits snugly in the notch and against the stab trailing edge. Epoxy the dowel in place.
9. Remove pins from surfaces and sand the top surfaces of the assembly.
10. Sand the elevators to the cross section shown on the plans.
12. Sand stab tips to match the elevators as shown on the plans.
13. Remove from plans and cut slots for the hinges.
14. Round the stab leading edge and tips. Do not round the leading edge in the area where it butts against the aft fuselage filler block.
15. Sand the elevator leading edge in the shape of a "V". Do not round off the stabilizer trailing edge at the hinge line.
16. Hinge the elevator to the stab and check for fit. There should be a minimum gap between the stab and elevator at the hinge line and about 1/16 inch clearance between the stab tip and the elevator edge.
17. Remove elevator and hinges and set them aside for now.

VERTICAL STABILIZER (FIN) AND RUDDER

1. Place waxed paper over fin and rudder plans.
2. Using C/A, assemble and glue the vertical fin and rudder parts in their respective places as shown on the plans including the scrap balsa filler block.
3. Mark the hinge locations on the vertical fin and rudder.
4. Mark the notch in the rudder for clearance of the elevator 3/8 inch dowel connector.
5. When the glue has set up remove the fin and rudder from the plans and separate them.
6. Sand the filler block to the smooth curve shown on the plans.
7. Round off the leading edge of the fin and sand the top of the fin to the shape shown on the plans.
8. Cut the hinge slots in the fin and rudder.
9. Sand the rudder to the cross section shown on the plans.
10. Sand the leading edge of the rudder to a "V" shape as shown on the plans.
11. Add the notch in the rudder for clearance of the elevator 3/8 inch connector dowel.
12. Assemble the fin, rudder, and hinges and check to make sure of a minimum hinge line gap. The top of the rudder should clear the bottom of the fin crosspiece by about 1/16 inch.
13. Disassemble the fin, rudder, and hinges and set them aside for now.

THIS COMPLETES CONSTRUCTION OF THE TAIL SURFACES

FUSELAGE CONSTRUCTION

1. Place waxed paper on your work surface and locate the fuse sides and splice together as shown. Lay a straight edge along the top edge to as-sure straightness.
2. Lay the right hand fuse side over the fuse side plan view and mark the locations of bulkheads 1, 2, 3, and the 1/4 inch by 3/8 inch vertical braces
3. With the right hand fuse side pinned to the work surface, lay the top edge of the left hand fuse side against the right hand fuse side, and extend the lines made in step 2 onto the left hand fuse side.
4. Locate the 1/4 ply firewall (bulkhead #1). Referring to plan view of bulkhead #1, draw a center line along the front side of the bulkhead (top to bottom)
5. Measure down 1 1/2 inches and make a cross mark on the center line of bulkhead #2. This will locate the reference center for engine mounting.
6. If using a fixed tricycle nose gear, drill the motor mount for the landing gear wire using a #20 (.160 inch) drill bit as shown in the fuse plan top view. Note the offset from the center line which is necessary for motor mount integrity.
7. Put the engine mount in place such that the engine bearers are aligned with the center line drawn on the firewall and the center of the engine is located at the cross mark drawn on the firewall and tack glue with a very small amount of C/A in at least two places. Don't overdo this or you will damage the firewall during removal of the motor mount later.

Note: Prior to drilling holes in the plywood bulkhead, put a drop of C/A on both sides of the bulkhead where the holes are to be drilled. This will result in nice clean, unsplintered holes.
8. Drill out the mounting holes using the holes in the engine mount as a guide. A #33 (.133 inch) drill if you are using 4-40 screws.
9. Remove the engine mount from the bulkhead by giving it a sharp rap. Turn the bulkhead over and open up the mounting holes to accept the blind nuts, going only deeply enough to accommodate the blind nut shank. Use a #24 (.152 inch) drill which will give a snug fit for the blind nuts.
10. Referring again to the plan view of bulkhead #1, mark locations and drill out the two 1/4 inch diameter fuel line holes, and the 3/16 inch diameter throttle and nose gear steering pushrod holes. Note: The throttle pushrod location must be tailored to the specific engine being used; the location shown is for a K&B 61 engine.

11. Put the engine mount in place and add the mounting bolts. Place the blind nuts on the bolts and tighten down so that the blind nuts pull into the wood and bottom out against the surface of the ply bulkhead. Remove the engine mount and place a couple of drops of C/A at the blind nuts. After the C/A sets up run a bolt into each nut to assure the threads are clear. If any excess effort is required for this, back the bolt out and run a 4-40 tap through the blind nut to clear the threads.
12. Drill and tap the engine mount holes to suit your engine.
13. Locate the 1/4 inch thick ply bulkhead #2. Referring to the plan view of bulkhead #2, mark the location of the 3/8 diameter dowel hole for wing hold-down and drill it out using progressively larger drills up to the final diameter of 3/8 inch.
14. Drill the 3/16 inch diameter holes for throttle and nose gear pushrod keeping them as close to the edges of the bulkhead as possible for fuel tank clearance.
15. Cut a piece of waxed paper the length of the fuse side and place on the work surface. Place the right hand fuse side over the waxed paper and pin to the work surface.
16. Install the trapezoidal balsa piece to the top edge of the fuse side. refer to the plans for location and length. The 3/16 inch wide position of the trapezoidal stock butts against the top of the 3/16 inch thick fuse sides.
17. Add the 3/32 inch sheet balsa fuse doubler between bulkheads #2 and #3 and the 1/4 inch by 3/8 inch vertical braces.
18. Repeat steps 16 and 17 for the left hand fuse side. Make absolutely sure you make a left and a right hand side. You can assure this by making both sides at the same time with the fuse side top edges face-to-face on the work surface.
19. Pin the right hand fuse side to the work surface and install bulkheads #2 and #3 making sure they are perpendicular to the fuse side.
20. After the glue dries, and with the right hand fuse side still pinned to the work surface, add the left hand fuse side making sure it is aligned to the bulkhead and right hand fuse side. A tri-square should be used to guarantee alignment of the fuselage top edge from nose to tail. After the glue sets up completely, remove the structure from the work surface.
21. Cut the aft 1/4 inch by 3/8 inch cross braces to length and draw a center lines on each.
22. Add these cross braces between the fuselage sides.

23. Locate the two 1/8 inch fuse top blocks. Carefully glue them together at their butt ends and draw a center line down the longitudinal axis of the assembly.
24. Put the top view plan on the work surface and cover it with waxed paper.
25. Pin the fuse top pieces to the work surface over the plan top view with the center line you have drawn showing.
26. If you have not already done so, draw center lines on bulkheads #1, #2, and #3.
27. Pin the fuse sides to the fuse top and align the center lines drawn on the bulkheads and cross pieces with the center line drawn on the fuse top.
28. Run C/A glue along both the inside and outside seams including the cross bracing and the bulkheads thus firmly attaching the fuse sides to the fuse top.
29. Remove fuse from work surface and install the 1/8 inch stab riser plate.
30. Add 1/4 inch triangular blocking between stab riser plate and fuse sides.
31. Add 3/8 inch thick balsa spacer between the stab leading edge and the aft end of the fuse top.
32. The next step here is to construct the engine cowling. Start by temporarily installing the engine and mount to the fuselage.
33. Make a ring from 1/32 inch to 1/16 inch thick cardboard and tack glue it to your 2 1/2 inch spinner back plate. Trim the cardboard to the outline of your spinner. Note that your choice of spinners is critical to this. DuBro and Goldberg spinners are not interchangeable with CB, Spinrite, TruTurn and others.
34. Locate the 2 1/2 inch diameter, 1/16 inch thick plywood ring provided in the kit. Open up the hole to approximately 1 1/4 inches and tack glue it to the cardboard ring on the spinner back plate so that it is concentric with the prop shaft. When the cowl is completed, the cardboard ring will be cut away leaving a 1/32 inch gap between the cowl and the spinner.
35. Mount the spinner with the cardboard and plywood rings and secure it with the prop nut and washer. (You'll also probably have to use a 1/2 inch spacer to substitute for the prop thickness to accomplish this.
36. Install the 5/8 inch thick balsa top block and the 5/8 inch triangular balsa stock as shown on the plan side view. Maintain at least 1/16 inch clearance between the inside of the cowl and the engine assembly during construction of the cowl.□
37. Add the 1/4 inch balsa top block.

38. Trim and add the 3/4 inch balsa bottom block and its 5/8 inch triangular stock as shown in the fuse top view.
39. Add the left hand side 3/16 inch thick balsa side block.
40. Trim the right hand side 3/16 inch balsa block to clear the engine and add it to the cowl assembly.
41. Add the muffler and trim the cowl to fit.
42. Remove the engine and muffler.
43. Drill exit holes in the aft fuselage sides for the elevator and rudder pushrods.
44. Add 3/8 inch thick balsa spacer between the stab leading edge and the aft end of the fuse top.
45. Reinstall the fuselage to where it was at the end of Step 28 and glue the stabilizer in final position per the top view drawing. Using this sequence assures alignment of the stab perpendicular to the fuse center line.
46. Make elevator and rudder pushrods.
47. Add servo mounts and temporarily install pushrods for clearance check.
48. Add the 3/32 inch plywood at the tail post and the cross-grain balsa sheeting fuselage bottom.
50. Add 1/4 inch triangular blocking in the fuel tank area as shown on the drawings.
51. Add 1/8 plywood hatch mount on the forward face of the bottom of bulkhead #2 and brace it with 1/4 inch triangular stock.
52. Add 1/2 inch by 5/8 inch balsa block to the bottom of bulkhead #1 as shown on the drawing.
53. Add the 1/16 inch ply hatch tongue to the forward end of the lower hatch block.
54. Install the hatch block and countersink the hatch screws.
55. Add the 1/4 inch plywood plates and triangular blocking for the rear wing bolts.
56. The assembly can now be removed from the work surface and sanded to its final configuration as shown in the various cross sectional views.

FITTING THE WING TO THE FUSELAGE ASSEMBLY

57. Place the wing in the fuse saddle using the 3/8 inch diameter dowel pin to locate the leading edge of the wing.
58. Adjust the wing saddle, wing dowel and the dowel hole in bulkhead #2 for a snug fit and make sure that the top of the wing is parallel to the stabilizer.
59. Install a pin in the center of the aft end of the fuse. Tie a piece of heavy thread to the pin and check the distance from the pin to each wing tip trailing edge. Adjust the wing until both tips are equidistant from the fuse tail post
60. Take the 1/16 inch thick ply wing plate and locate its center and draw a center line. Score the line with a knife and gently crack the plate so that it will conform to the wing dihedral at the center section. Glue the plate in position as shown on the plans.
61. With the wing still in place and centered, place a mark on the ply wing plate where the edges of the fuse intersect the plate. Using a tri-square, extend the lines up the plate.
62. Measure up 3/4 inch on each line and connect these marks. Measure in from each side 3/4 inch and make a mark on this line. These marks are the wing mounting bolt locations.
63. Hold wing in place with a piece of masking tape at the trailing edge of the ply piece to prevent slipping or movement of the wing during the next steps.
64. Using a #7 drill (tap drill for 1/4-20 bolt), drill at one of the marks through the 1/16 inch ply plate, the wing, and the 1/4 inch ply plate in the fuselage.
65. With the wing in place, run a 1/4-20 tap through the hole and tap the 1/4 inch ply plate. Be sure the drill and tap are perpendicular to the 1/16 inch thick plywood plate surface.
66. Remove the wing and put C/A in the tapped hole of the 1/4 inch thick ply plate. When the C/A is completely cured, run the tap through the holes to clean up the threads.
67. Enlarge the bolt hole in the wing to 1/4 inch diameter for the wing mounting bolt.
68. Install the wing and bolt it in place with the one bolt attachment you have completed at this stage.
69. Drill and tap for the second wing mounting bolt and repeat steps 50 through 53 for this second bolt location□

70. Add the balsa filler block to the wing center section at the wing leading edge/fuselage juncture and shape to fit.
71. Remove the wing and place it aside for now.
72. Epoxy the vertical fin to the fuse/stab assembly making sure it is perpendicular to the stab. Add triangular stock blocking.
73. Thin some epoxy with alcohol and fuel proof the engine and fuel tank compartments and any areas that will be exposed after finishing is complete. □
74. This completes construction of the various parts of the aircraft

COVERING

Before starting to cover, all surfaces should be sanded as smooth as possible. The wing is covered first and because there isn't much 'meat' at the wing trailing edge, it is necessary to pin the hinges in this area. The following is one way of doing this:

1. Check the balance of the wing with the ailerons temporarily installed. Weight the lighter panel at its tip until wing balances, and then remove the ailerons and their hinges.
2. Cut two 5/8 inch strips of covering material, each about two inches longer than a wing panel. These will be used to cover the face of the trailing edge, overlapping the upper and lower surfaces by about 1/8 inch.
3. Apply the strips to the wing trailing edge, making sure the covering material edges are well sealed.
4. Slit the covering material at the trailing edge hinge slots and seal the slot edges.
5. If using polypropylene or pinned hinges, insert a hinge in each slot and drill through the trailing edge and hinge with a 5/64 inch drill. Insert a round toothpick through each hinge and cut it off even with the upper and lower surfaces of the wing. Do this carefully so that there is no bump left. Place a spot of thin C/A on the cut end to lock it in place.
6. Cover the rest of the aircraft.
7. Cut out the pushrod exits and seal the edges of the covering material around them.

8. The 4-40 blind nuts, bolts, and nylon connectors, used as control surface horns, should now be installed on the rudder and elevator.
9. Install the servos and pushrods in the fuselage.
10. Install the nose wheel (if used) and its pushrod control.
11. Install the engine and the throttle pushrod. Make sure you have fuel proofed this area before engine installation.
12. Cut open the servo opening in the wing and seal its edges.
13. Install aileron servo and pushrods.
14. Turn wing over and install main landing gear. Hold the wire in the grooved block with the straps and screws.
15. Make sure the tank compartment has been fuel proofed; then install the fuel tank and fuel and vent lines.

BALANCING

1. Assemble the aircraft with all of its airborne accessories such that it is in a flight ready configuration.
2. With the fuel tank empty, balance the aircraft at the center of gravity (CG) location shown on the plans.
3. The nose of the aircraft should point down a couple of degrees indicating a slightly nose heavy condition which is OK for initial flight testing. If the tail drops, meaning a tail-heavy condition, add nose weights, or move the flight battery, to the tank compartment until a slightly nose heavy condition exists. Firmly affix any weights in the tank compartment so they don't move around during flight. Don't even think about flying the aircraft in a tail heavy condition or you could be in for some very unpleasant surprises such as snap rolls at slow speeds and low altitude when adding too much elevator during climbout or landing.
4. If the nose drops more than a couple of degrees, try moving the flight battery to a rearward position. An airplane that is too nose heavy will not snap roll or spin and could run out of sufficient up elevator to land safely without using excess power and landing speed.

THAT ABOUT DOES IT - GO FLYING AND HAVE FUN

KILLER CHAOS

WING

3/32 x 4 x 30	Leading edge sheet	4
3/32 x 7/8 x 30	Trailing edge sheet	4
3/8 x 1/2 x 30	Spars	4
1/4 x 3/4 x 30	Leading edge	2
1 1/4 x 1/4 x 30	Trailing edge	
7/16 x 1 1/4 x 28 3/4	Ailerons	2
3/32 x 3 x 9 1/8	Center sheet (Bottom)	6
3/32 x 3 x 6 1/8	Center sheet (Top)	6
3/32 x 1/4 x 36	Cap strips	6
1/16 x 1 3/8 x 1 3/4	Landing gear doublers (Ply)	4
7/16 x 5/8 x 4 1/8	Landing gear block (hardwood)	2
7/16 x 5/8 x 1	Vertical landing gear block (hardwood)	2
3/8 x 7/8 x 3 3/8	Shaped center dowel block (hardwood)	2
3/8 x 4	Dowel (hardwood)	2
5/8 x 7/8 x 3	Rear wing filler blocks	2
1/16 x 1 1/2 x 3	Bolt plate	1
7/8 x 1 5/8 x 9 1/4	Wing tips	2
3/8 x 2 1/8 x 8	Center rib (rear)	1
7/8 x 1 7/8 x 3	Wing filler block	1
	1 set of wing ribs	22

STABILIZER AND ELEVATOR

3/8 x 3/4 x 23 3/4	Stabilizer main spar	1
3/8 x 1 x 13 1/4	Stabilizer leading edges	2
3/8 x 1 x 4 5/16	Stabilizer center blocks	2
3/8 x 1/2 x 2 3/4	Stabilizer tips	2
1/4 x 3/8 x 11 1/2	Stabilizer ribs	1
3/8 x 3 x 11 3/4	Elevators	2
3/8 x 5	Elevator center connector (birch dowel)	1

FIN AND RUDDER

1/4 x 2 3/8 x 2 3/8	Fin front	1
1/4 x 3 x 5 3/8	Fin center	1
1/4 x 3 x 6 1/2	Fin rear	1
1/4 x 1/2 x 4 1/4	Fin cap	1
1/4 x 3/8 x 8 3/4	Fin post (pine)	1
1/4 x 4 x 6 3/8	Rudder (top)	1
1/4 x 2 3/8 x 4 1/2	Rudder (bottom)	1

FUSELAGE

3/16 x 3 3/4 x 11 1/2	Front fuselage side	2
3/16 x 3 3/8 x 35 1/2	Rear fuselage side	2
1/16 x 3 3/8 x 12 3/16	Fuselage doubler	2
1/8 x 3 x 8 1/2	Top block (front)	1
1/8 x 3 x 29 1/2	Top block (rear)	1
1/4 x 3 x 4 1/4	Engine cowl top block	1
3/4 x 3 x 4 1/2	Engine cowl bottom block	1
3/16 x 3 3/8 x 4 1/4	Engine cowl side blocks	2
5/8 x 5/8 x 2 5/8	Engine cowl front block	1
1/4 x 1 x 2 7/8	Engine cowl front filler blocks	2
5/8 x 5/8 x 4 1/2	Engine cowl triangular stock	4
1/16 x 2 5/8 x 3	Nose ring (ply)	1
1/4 x 2 5/8 x 3 3/16	Bulkhead #1 (ply)	1
1/4 x 2 5/8 x 3 5/8	Bulkhead # 2 (ply)	1
1/4 x 2 5/8 x 3 1/4	Bulkhead #3	1
1/2 x 3/4 x 3	Tank compartment cross brace	1
1/2 x 3 x 5 7/8	Tank compartment hatch	1
1/16 x 3/4 x 2 5/8	Hatch front cross brace (ply)	1
1/8 x 1/2 x 2 5/8	Hatch screw plate (ply)	1
3/8 x 1/2 x 29 1/2	Trapezoidal balsa stock	3
1/4 x 3/8 x 36	Cross bracing	1
3/32 x 3 x 3	Cross bottom sheeting	8
1/2 x 1/2 x 3	Bolt plate brace	2
1/4 x 5/8 x 3	Bolt plate (ply)	2
3/32 x 7/8 x 3	Tail wheel plate (ply)	1
1/4 x 1/4 x 17 1/2	Triangle stock bracing	3
1/8 x 1 5/8 x 9	Stabilizer riser plate	1
3/4 x 1 3/4 x 3	Fuselage-to-elevator leading edge filler block	1

HARDWARE

17 inch molded canopy
1/8 Aileron torque rods with nylon connectors
4-40 x 3/4 engine mount machine screws with blind nuts
5/32 wire landing gear (nose gear and 2 main landing gear)
Nose gear steering arm with 5/32 collar
60 size engine mount with screws
#2 x 5/8 hatch screws
Main gear plates and screws
1/4-20 Nylon bolts for wing hold-downs
4-40 x 1 1/2 elevator horn with nylon connector
4-40 x 1 rudder horn with nylon connector