

- Main landing gear mount plate ¼" plywood
- Main landing gear outer plate 1/8" lite ply
- Front wing former 1/8" lite ply
- Front wing former doubler 1/8" lite ply
- Wing mounting block ¼" plywood
- Rear wing former 1/8" lite ply
- Tail wheel upper plate 1/8"plywood
- Tail wheel outer plate 1/8" lite ply
- Fuselage end plates (2) 1/8" lite ply
- 1/8" X ¼" X 7" tail filler balsa

- Parts bag #9:
 - #4 sheet metal screws (2)
 - #4 washers (2)



- Pin the **lite ply** right fuselage side to your building table as follows:
 - Lay 48" of wax paper on the table in a convenient location. Take the **lite ply** right fuselage side and pin to the table. Orient the side as shown in the picture, with the front to the left side of the table so there is at least 36" of room on the table to your right. You will also need at least 12 inches of building room above the top edge.



- Using a straight edge, glue the upper $\frac{1}{4} \times \frac{1}{4} \times 48''$ balsa stringer to the fuselage top.
 - Align the front edge of the stringer to the front edge of the fuselage side (towards your left).
 - Use the straight edge to ensure the stringer is absolutely straight and firmly pressed against the top of the fuselage side as you pin it along its full length at about 6'' intervals. It is best to pin the tail end first, and then the middle section. This ensures the stringer remains straight.
 - When completely flat, straight, and secure, glue the upper stringer to the fuselage side with thin CA



- Glue and mark the lower 1/4 x 1/4 x 30" basswood stringer to the fuselage side.
 - Lay the lower **basswood** stringer into place against rear of fuselage side and glue with **thin CA**. DO NOT PIN YET. Cut a section of 1/8" X 1/8" basswood to precisely 7" and glue in place as a doubler as shown with **medium CA**. The end goes even with the end of the stringer.



- Using a ruler and starting at the forward (left) end of the lower stringer, place pencil marks at the following locations along the stringer:
 - 7" and 7 1/4"
 - 14" and 14 1/4"
 - 21" and 21 1/4"
 - 27" and 27 1/4"
 - 30"
- Place the **lite ply** fuselage end plate into position with its aft edge at the 30" mark made above on the lower stringer. Use builder's square to ensure the plate is square with the upper stringer. Note the lower edge is angled slightly, and place this edge on the bottom in the correct direction. Glue the plate to upper stringer with **thin CA**.
- Using straight edge, pin the lower stringer to the worktable and glue to the end plate with **thin CA**.

- Cut and glue the **1/8" X 1/4" X 7" balsa** to fill the area between the stringers along the aft edge of the end plate. This will be used to later glue the sides together at the tail.
- Trim the excess stringers that extend past the end plates.



- Build the left fuselage against top of right fuselage as shown in the photo. Align the pen markings as shown. Note that the front edge **will not** line up. Be sure to mark the lower stringer in the same way the right lower stringer was marked.



- Add **1/4 x 1/4" balsa** vertical braces.

- Line up a straight edge on the marks you made on the two lower fuselage stringers. Mark the upper stringers where the straight edge crosses them.
- Using the razor saw and sandpaper, cut and fit the vertical braces at the marks you have made on the stringers (4 per side). It is usually easiest to cut the braces slightly larger and use the sheet of sandpaper to slowly abrade them to a perfect fit. Use care not to force into place, as that will misalign the stringers. Glue into place with **thin CA**.
- You must now choose your method of bracing the tail section of the fuselage sides. Your choices are:
 - Balsa diagonal braces. Now is the time to cut and glue **1/4 x 1/4 balsa** braces diagonally between the vertical braces.
 - The diagonals must run from the upper rear of each vertical brace to the lower front side of the next brace. If you run the diagonals the other way, they will interfere with the placement of the turtle deck formers later.
 - Do not place a diagonal in the two forward openings yet. These must be gusseted after the fuselage top has been installed.
 - Gusset all joints along the lower stringers using **medium size triangle balsa** stock. **Do not gusset the top forward side of the vertical braces or the top back side of the forward vertical brace.** Use **medium CA**.





- Kevlar thread or carbon fiber rod bracing. The photos show where to install **medium size** triangle balsa gusseting to the fuselage sides. Study the photos carefully, **DO NOT ADD THEM UNLESS IT IS SHOWN IN THE PHOTO**. You will have to glue the turtle deck formers to these locations, and gussets will interfere. Use **medium CA**.
- Glue the wing saddle doublers to the fuselage sides using **medium CA**. The points to align are the forward vertical portion of the wing saddle and the 1/8" X 1/8" lower stringer doubler in the rear. Sand if necessary to fit these two points.



- Mark the very front (left) of the right fuselage side the same distance in as the firewall thickness (normally 1/4").



- Using **medium CA**, glue the doubler to the forward fuselage former (the one with notches). Be sure to align the bottom and sides. The side with the doubler is now the front of the former.



- Check the forward fuselage former fit to the right fuselage side.
 - Remove the left fuselage side from your building table and set aside on a flat surface.
 - Using a builder's square, place the forward fuselage former in place on the right fuselage side.
 - The doubled side of the former goes forward (left). The aft side of the former aligns with the forward edge of the wing saddle cutout. The top of the former is spaced 1/8" below the upper stringer.
 - If necessary, sand the sides of the former to get a good fit with the fuselage side.

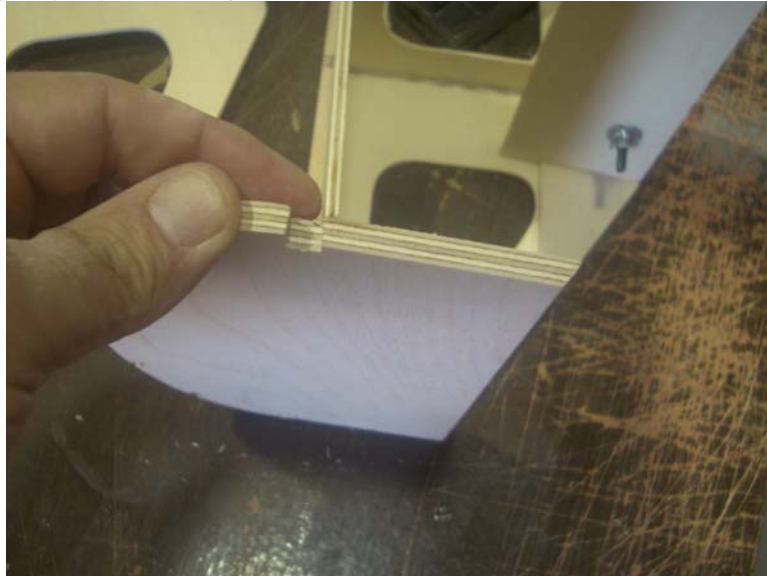


- Glue the front of the **lite ply** fuselage top to the right fuselage side as follows:
 - The writing on the fuselage top goes up.
 - Align the front of the fuselage top with the 1/4" mark that you made on the right fuselage side. The top goes flush against both the upper stringer and the lite ply side.
 - Before gluing, check the entire fit of the top by rotating it back along the side. The first 1/4" cross brace should fit the notch made for it in the top. If it does not, adjust by trimming the notch slightly.
 - While holding the top in place at the front of the fuselage, position the front fuselage former as described above.
 - With both these parts square to the building surface and to each other, glue them to the side using **thin CA**. You will only glue the portion of the fuselage top that is forward of the former.
 - When you are certain that the top and former are square, glue the former to the top with **thin CA**

- Using **epoxy**, glue the 1/4" **plywood** landing gear plate into position.
 - The bottom of the plate goes flush with the lower edges of both the forward former and the side. Ensure the bevel on the aft edge of the plate is mated properly to the front former.
 - **Epoxy medium** size triangular balsa stock along the length of the joint between the former and the plate, except, leave a space to clear the cutout in the center of the former.

- **Epoxy** the **lite ply** forward landing gear former against the front of the landing gear plate
 - The landing gear former should be square to the plate. The lower edge of the former aligns with the bottom of the plate.
 - Glue **medium size** triangular balsa stock along the length of the joint between the plate and the former with **medium CA**.

- **Epoxy** the **1/4" plywood** firewall into position on the right fuselage side and top.
 - Prior to gluing, check the fit of the firewall against the fuselage side. There is a slight bevel, which may have to be adjusted slightly by sanding.



- Hold the fuselage top square with the building surface and in contact with the firewall. Ensure the **upper surface** of the fuselage top is flush with the **bottom** of the 1/4" cutout in the firewall (the cutout is for the left fuselage upper stringer.)
- **Epoxy large** size balsa triangle stock along the length of the joint between the side and the firewall.
- **Epoxy medium** size balsa triangular stock along the joint between the top and the firewall.



- Install the left fuselage side (ignore aluminum gear angle in photo).
 - Using a sanding block and 80 grit paper, sand the surfaces that will be in contact with the left fuselage side. All surfaces will be the same height and absolutely level to the building table.
 - Remove the right fuselage assembly from the building board.
 - Place the assembly in an inverted position on the building table so the firewall is just off the end.
 - Using **epoxy** on the firewall and landing gear plate, position the left fuselage side in place. While the epoxy cures, use the builders square to ensure both sides are absolutely square to the table. The upper stringers (now against the table) must touch the table for their entire length. Use weights as necessary to hold the assembly in position.
 - When absolutely satisfied that the entire assembly is square, use **thin CA** along the left side where it meets the front wing former, fuselage top forward of the wing former, and landing gear former.
 - **Epoxy** triangular balsa stock to the appropriate joints as was done to the right side previously.



- Glue the **lite ply** landing gear outer plate in position.
 - Sand the surface of the 1/4" plate previously installed to ensure a perfectly flat face.
 - Glue the outer plate into place with **medium CA**. Ensure a good bond is made with both sides and both formers.

- Glue the forward fuselage access plate into place.
 - Check the fit before gluing. It will be necessary to **sand a bevel** on the aft edge that meets the landing gear plate.
 - **Epoxy** the plate into place.
 - Glue **small size** triangular balsa stock along the joint between the side and plate using **medium CA**.
 - Sand **medium size** triangular balsa stock to fit the angles of the plate to the firewall and also the plate to landing gear former joints. **Epoxy** stock into place along these joints.



- The front access hatch is optional, but very convenient. If you choose not to install it, just cover over the opening in section VI. To install the hatch,
 - Locate the three retaining strips. On the firewall side, glue one strip from the inside along the forward edge so it extends about $\frac{1}{4}$ " into the opening.
 - Sand a rounded edge on the second strip and glue it directly over the first strip, only on the outside of the plate.
 - Glue the third strip from the inside along the gear end of the plate. It should extend as far into the opening as possible and still remain bonded to the plate.
 - Slide the hatch into the slot created by the front strips, and slip the rear into place.
 - Drill and install two #4 sheet metal screws (from bag #9) and washers through the rear of the hatch and the aft strip to retain it.
 - Remove the hatch and set it aside for final installation.



- Gently bend both fuselage sides into position along the full length of the fuselage top. Ensure the top is flush against the upper stringers and glue with **thin CA**.



- Position the **lite ply** aft wing former and glue with **thin CA**.



- Glue rear wing plate into place with **medium CA**. The chevron “point” goes towards the front of the fuselage. The plate fits between the lower basswood stringers and flush with the surface of the stringers.
 - Glue **medium size** balsa triangular stock to the rear side of the aft wing former as shown in the photo using **medium CA**.



- Glue the aft fuselage sides together.
 - First sand the two sides so they will fit together as shown in the left photo. When the sanding is complete, the sides together should be 3/8” thick.
 - Lay the fuselage inverted on the work table and bring the sides together. The sides should be in contact with the table for their full length and square with the building table. Mark the centerline of the gear plate and rear wing former as show in the right photo, and use these marks to sight down the fuselage and ensure it is absolutely straight.

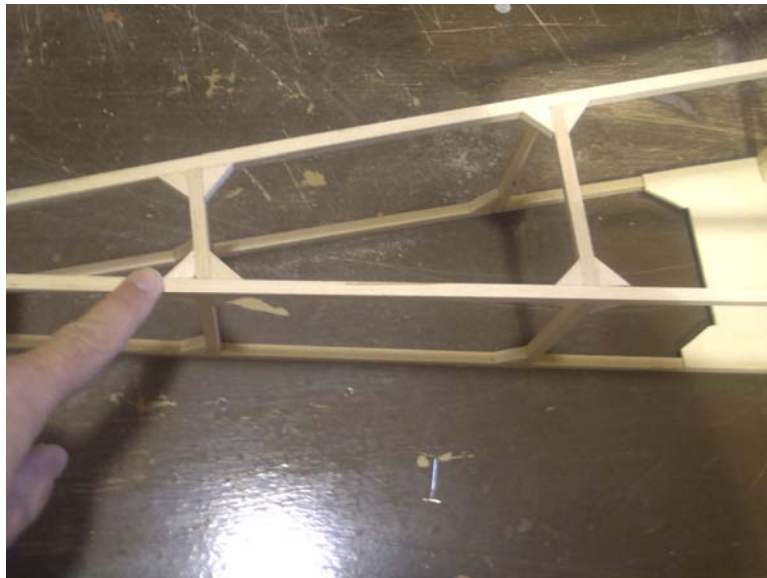
- Only when you are **COMPLETELY SATISFIED** that the sides are true and square, glue together with **thin CA**. Take your time as this step is critical!



- Add the cross braces between the lower fuselage stringers.
 - Use the turtle deck formers to cut **1/4" X 1/4" balsa** cross braces to the proper length. **DO NOT glue the turtle deck formers at this time!** Use the fuselage top to size the front cross brace.
 - Glue the cross braces into place using **thin CA**.



- Glue the two tailwheel plates into place using **medium CA**. The **1/8" plywood** pointed plate fits between the fuselage stringers flush with the surface of the stringers. The **lite ply** plate goes over the first plate as shown. Do not trim the overhang past the tail. We will use this later to align the wings.



- If you plan to use Kevlar string to brace the fuselage structure, add medium size balsa triangle stock as shown.
- If you are using balsa diagonals for bracing, cut and fit 1/4" X 1/4" balsa diagonals between the lower stringers at this time.
 - Also add the side diagonal bracing that was left out earlier.

- Gusset all corners that do not have a diagonal joint using **medium size** balsa triangle stock.



- For the Kevlar bracing method, add **medium size** balsa triangle stock between cross braces as shown using **medium CA**.
- You have now completed the fuselage initial construction. Set the assembly aside while you build the wings and tail surfaces.