

RADIATOR ASSEMBLY

REV 1

The radiator is an important assembly which other components align to. Take your time and ensure you keep the radiator straight and aligned. The original radiator is made of metal; the kit uses plywood. You will need to prime and then paint the radiator to simulate the real metal. You might consider painting the honeycomb.

1. Locate the following parts -

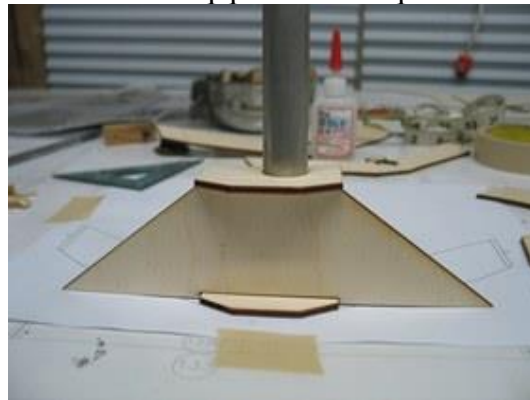
#158, base template, plywood – 1 piece

#162, brass tube – 1 piece

#153, plywood, center base support – 1 piece

#155, plywood, base triangle template – 1 piece

2. Secure the base template #158 to your building table. This template will help you build the radiator correctly. Insert the brass tube into the center base support #153, **do not** glue. Use the base triangle template #155 to locate the proper height of the center base support. See photo below –



3. The center base support of the radiator needs to be aligned to the bottom template support which ensures you will build a straight radiator. Use a triangle for this alignment. You can temporarily use the brass tube to help with this alignment. See photo below –



4. Locate the following parts -

#150, plywood vertical lower sides – 2 pieces

#152, plywood outer base – 2 pieces

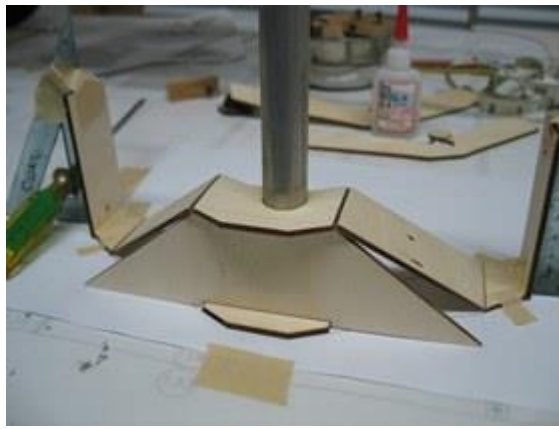
7. The hole in the vertical support #150 is located at the radiator bottom, ensure you have this support oriented properly before you glue. A screw will end up going through the hole in this support which holds the metal side panels in place. Position the outer base support #152 correctly against the vertical support #150. Glue these two (left, right) outer base supports to the vertical supports. The prototype used wood glue, such as, Tite-bond to assemble the radiator frame. You might consider something like that. Use a triangle to help with alignment. Do not glue these parts to the base template. You might put some wax paper over the base template to keep that from happening. Again, the base template ensures you have the pieces aligned correctly, as you will be adding the radiator aluminum grill which require a warp free radiator frame. See photo below –



8. Locate the following parts -

#151, plywood angle base support – 2 pieces

9. The angle base support #151 has two slots in it as well as an arrow mark. The arrow should point forward towards the propeller. The slots are used for screws that will be installed later. Test fit the angle support in position. It should line up with the outer base support as well aligns to the center base support. You might have to slightly sand the angle base support to properly locate it. The angle base support should be flush with the center base support and butt joint the outer base support. Once you're satisfied, glue the two angle base supports in position. See photo below –



10. Ensure the radiator pieces you just assembled are glued well. Re-inspect them and re-glue if needed.

11. Locate the following part –

#156, plywood, vertical frame support – 2 pieces

#154, plywood, center frame top support – 1 piece

12. The center top support #154 should align to the radiator base. The two vertical template supports #156 will help locate center top support height. Slide the center top support onto the brass tube orienting that piece to the radiator base. See photos below –



13. You could use the brass tube #162 to help align these pieces. Notice that the center top support #154 has two small holes which should be on the starboard side or left side if you are facing the front of the radiator.

14. You will now attach the arched sides connecting the center top support to the radiator base assembly.

15. Locate the following parts –

#149, balsa, inner arch inserts – 2 pieces

#157, plywood, arch supports – 4 pieces

#160, plywood, sides – 2 pieces

#161, plywood, sides – 2 pieces

16. Test fit the two plywood sides to the center top support and the radiator base. The top of the sides should be flush with the center top support and should sit on the top of the vertical base support. The two small holes are to the back of radiator and near the top of the vertical base support. These holes will be used for a fitting holding the radiator to the fuselage. To easily install the sides you need to glue the arch supports to the sides first. Test fit the arch supports to the sides and then test fit into position onto the radiator. Once you understand how these all go together it's time to glue them.
17. Glue the arch supports to the sides ensuring that the two small holes are not blocked and that the bottom of the arch support is flush with the bottom of the sides which means they would stop short being flush with the top of the side. See photos below –



18. Keeping all the radiator parts in alignment, glue the two sides #160, 161 into position. Using a CA glue, such as ZAP with a kicker might help with this. It is rather important that the radiator assembly be square and not twisted. Do the best you can. See photos below –



19. Adding the balsa side insert #149 will help strengthen the side pieces. Test fit the balsa side inserts; you might have to sand them to get a good fit. The balsa sides should seat against the plywood sides and slightly below the arch support edges. Once you're satisfied, glue the balsa inserts into position. See photo below –

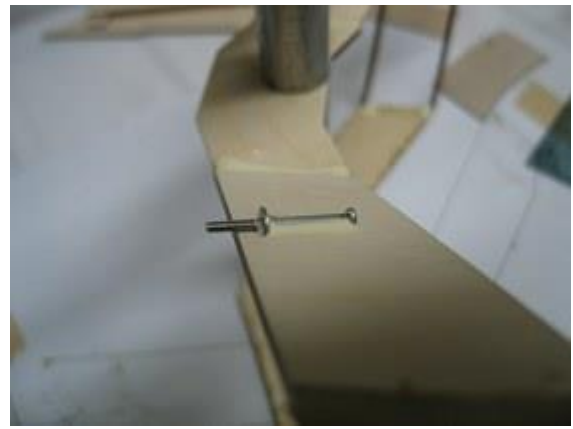


20. Locate the following parts –

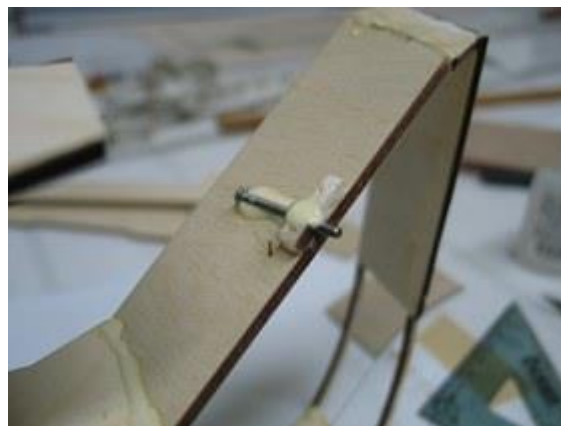
#115, washer – 2 pieces

#242, screw, 1 inch long – 2 pieces

21. The two slots in the angled base support #151 hold a screw and washer. These screws are used for the front Fokker handles which will hold the upper chin sheet metal in place. It is important that these screws don't come loose in flight. The washer goes in the front slot and the screw head goes in the rear hole. The washer and screw go **underneath** the angled base support. Glue the washer and screw to the bottom of the angled base support. See photos below –



22. When the Fokker handles go onto these screws they need to be supported evenly. Using some scrap balsa add some wood to both sides of the screw so it is flush with the angled base support edge. See photo below –



23. Locate the following parts –

- #109A, metal pins – 4 pieces
- #111, 2-56 machine screw – 2 pieces
- #113, 2-56 hex nut – 2 pieces
- #122, #2 wood screw – 2 pieces
- #209, FR4, aluminum tube – 1 piece
- #295, FR4, fittings – 2 pieces

24. With the radiator frame securely glued twist the brass tube out of the frame. The typical radiator cap height is 2-1/2 inches above the center top support. You can cut the brass tube 2-1/2 inches now or wait till you have the top balsa support #182 install and then see where you want to cut the brass tube. Either way glue the brass tube #162 into the center top support where the brass tube

bottom is flush with the bottom of the center top support. Again, ensure the brass tube is glued rather well to the plywood.

25. The upper radiator is secured to the fuselage with a aluminum tube from the radiator to the fuselage. It is rather important that the radiator is secure to the fuselage, keeping it from getting into the propeller. The two holes on the radiator side pieces are for the fitting #295 which will secure the top part of the radiator to the fuselage. The FR4 is messy from the laser cutting. Slightly sand the fittings, cleaning them up. The aluminum tube needs to be cut in half then the ends flatten with pliers and drilled with at 3/32 diameter drill bit. At this time go ahead and cut, flatten and drill the ends of the aluminum tube. The ends should be flatten about a 1/4 inch. Drill a 3/32 hole in the center of the flatten ends. You can flatten the ends with a pair of pliers. The aluminum tube will mount on the inside of the fuselage. Assemble these pieces together and test fit to the fuselage. See photo below –



26. Locate the following parts –

#233, fastener, single handle – 2 pieces
#230, washer, brass – 2 pieces
#293, metal, lower radiator cover – 1 piece
#294, folder, template lower cover - 1 piece

27. The lower radiator cover is metal which is secured to the bottom of the radiator and wraps around the radiator sides which is overlapped by fuselage side panels which secures it in position. (This same metal cover #293 goes over the fiberglass chin #704.) With the radiator in position, test fit the folder #294 to see how it bends and fits into position. Place the folder onto the metal #293 marking the lower radiator cover outline. Using scissors or tin snips, cut the

metal to shape. You might cut the metal a wee-bit larger in the event you need to trim it to shape. You will need to cut the center for your propeller shaft and then drill two 3/32 holes for the screws #111. Test fit the sheet metal #293 in place; you want the metal to fit tightly in position. The back of the propeller should be at least 1/4" in front of this sheet metal. You will notice that you will have to crease the sheet metal at the center base support so it can hug the radiator base outline. That crease should only be about a 1/4 inch or so long as the top chin sheet metal is round near the engine shaft opening. See photo below –



28. The ends of the lower radiator cover will be secured by the aluminum side panels, as they cover this piece securing it position.

29. Locate the following parts –

#182, balsa, radiator top – 1 piece

#703, honeycomb grill – 1 piece

30. Two key radiator pieces are the balsa top and the honeycomb grill. Both will require some adjustments to fit your project. The honeycomb grill will need some minor cutting on the sides to snugly fit into your radiator frame. Depending on your engine, you might have to remove some of the rear of the honeycomb to clear certain engine parts. The goal of the grill would fit the radiator frame tightly and have minimum air gaps. The top of the radiator is hard balsa which needs to be sanded to shape. Depending on your subject plane you might only need one side of the radiator top. Prior to sanding / cutting the balsa top #182; understand the shape angles needed. You should test fit the engine shroud templates #126 or #128 which will show you the curve you will need as well as referencing the plans. Note that the engine shrouds will fit tightly onto the radiator top; ideally, with no air gaps due to

wrong angles. Determine your radiator top style and cut / sand to shape. Take your time. See photos below -

