

Fokker D6 Instructions

Rev 1

Building the Fokker D6 is not that complicated. The difficult parts have been completed for you and you should find it rather easy to build. The kit consists of two wings, fuselage and the tail area. The recommended building sequence should be the bottom wing, top wing, rudder, stabilizer, elevator, sub-wing and then fuselage. The photos will help you understand how the parts go together and how the plane is built. The text below has some helpful suggestions and instructions. You should have some building experience and be familiar with some aircraft terms such as, *CG* and incidence. If you have questions, contact us.

Bottom Wing

The bottom wing will be built in halves, joined; making the wing one piece. Take your time and keep the wing flat and warped-free. Note that each rib has a bottom tab that will be removed prior to adding the rib capping. The spar webbing is pre-cut and numbered for you, so, the wing will go together like a puzzle. Don't be concerned if the spar webbing numbers are visible or not when positioned; but just insure the arrow is pointed towards the ceiling. The spar webbing is design to be flush with the top and bottom of the rib, making the spar/webbing the full vertical length of the rib. As you put the pieces together remember this as it will help you ensure that the parts are positioned correctly.

Some things to remember -

1. The plywood spar webbing is exactly cut to the proper size.
2. The spruce/balsa spars seat all the way down into the rib.
3. The rib capping will go over the spars.
4. Work from the inner wing (root) towards the wing tip.
5. The rib bottom tab will be removed before rib capping is added.
6. Point all spar webbing arrows toward the ceiling.
7. Double check spar webbing before gluing.
8. The top of the wing is flat.
9. Saw-tooth plywood is added second to last.
10. Keep the wing flat and straight.

The spar consists of two pieces. The top of the spar is balsa #38 and underneath that is spruce #54. The bottom spar is identical to the top. The balsa spar #38 will be added after all the spar webbing is in place. The top of the rear spar and maybe some of the top front spar might need some sanding as the contour of the rib slopes downward towards to trailing edge.

Locate all ribs BR1-9, spar webbing Y1-16, Z1-16 and spars #38, 54. You need to build a left and right wing panel, start with either. Roughly position the ribs and spar webbing on the plans. You will start building with ribs BR1-2 and then rib BR3 continuing towards the wing tip inserting the front and rear spar webbing as you go. Note that the spar should extend to the right of rib BR1 so, when the wing halves are joined the two spars connect. Keep the top of the spar webbing level with the top of the rib and keep the ribs seated down on the table. You want the wing flat. Note the spars might need slight sanding to fit into the ribs. Make sure the spruce spars are seated all the way down into the rib. The spars passing the last rib will be trimmed off later. You will notice an "arrow" on all spar webbing; this indicates that this end is up. So, ensure you have all the "arrows" pointing to the ceiling as you glue the webbing into place. Take your time, if the ribs get out of position you will have issues with the front saw-tooth pattern and rear trailing edge. Continue adding the ribs and spar webbing working your way to the wing tip. You should have the ribs, spar webbing and the spruce spars glued in place now. Add the stringers #30 to the wing. Trim all stringers and spars that go beyond outer rib BR9. Add and glue the trailing edge #52 in position. Locate two n-strut fittings #123. These fittings are installed on the topside of the bottom wing. Test fit the n-strut fittings #123. Reference the plans; notice they should be roughly 7/8" from the inside of rib BR8. Use a 1/16" drill and drill four holes for screws #122. Install the n-strut fittings #123 with screws #122. Note that once the covering is in place, you will not have access to these screws unless you cut the covering; which is not the end of the world. Add the ribbon tape #52 now. You can start at the root rib and work your way out to the wing tip and back to the root. Notice on the plans where the ribbon tape should go. The ribbon tape goes up and under the ribs. The ribbon tape is a simple way of keeping the ribs from twisting. You can add a little glue at every other rib location if desired. The ribbon tape should be a little tight. With the one wing panel semi-built, build the other wing panel as you did above. Notice on the plans where the two wing panels join. Keeping the two wing halves flat and straight. Test join the wing panels. Adjust the spars #54 if needed join the wing halves together. Place and glue plywood support #46 in position. This support will help secure the bottom wing fitting #305. Now add and glue the center spar webbing #C1-4. The wing should be straight and flat. If not, you can probably fix some minor mistakes with the covering and the N-struts. Add the balsa spars #38 now. Do not cover the n-strut screws #122. The bottom wing is fitted to the fuselage using fittings #305. On the plans you will notice red lines indicating the outside edge of the bottom longerons. When you build the fuselage, the bottom longerons #405 will stop at the red line, so, your fitting #305 should start there, making a snug fit when mounted to the fuselage. You will add fittings #305 when you mount the bottom wing to the fuselage. Remove the feet from the bottom of the ribs. Using a T-type sanding bar, sand the spars to the contour of the rib. Carefully, do

not sand into the ribs. Add and glue the nose rib BR5A into position. The saw tooth plywood #63-1 thru #63-4 is added before the rib capping. The plywood has the word " TIP " and "ROOT" laser etched in one corner. That locates what end should be at the wing tip or root. Do not get the plywood mis-oriented. Test fit into position. The plywood should line up with the ribs. Remember the plywood is laser cut exactly. You might need to adjust the plywood slightly if the ribs are a wee-bit off. You must "wet" the plywood before adding it. This will soften the wood so it can be wrapped around the leading edge without cracking. You can add a little ammonia into the warm water which will loosen the glue in the plywood. Soak the saw tooth plywood #63-1 thru #63-4 for 10 minutes in warm water. Paying attention where the saw tooth pattern stops on the spars glue the saw tooth tips to the top spar. Take your time. Using a slow glue will help you align the plywood. Start wrapping the plywood around the rib noses and glue as you go. Try to keep the plywood tight and aligned as you go. Repeat for the other wing panel. Note that the saw tooth plywood is attaches to the spar which is below the fabric, this is correct. So, when the fabric is added you should only see part of the saw tooth pattern. Add rib capping #20 to both sides of the rib. Try to keep the rib caps center on the rib, as the fabric rib tapes will follow the rib caps. The rib capping on BR1 and BR9 should be flushed with the outside of the rib, see the plans. Start on the bottom of the wing. The bottom rib caps will butt join up with the trailing edge continuing towards the leading edge. On the top of the wing the rib capping should be trimmed at the trailing edge and slightly sanded round. Keep the rib capping centered and level. The plywood wing tips #22 go into position next. The wing tips follow the center line of rib BR9. Use a pencil to mark the centerline. I found gluing the wing tip a little at a time working from the rear towards the leading edge helps bend the plywood wing tip into position. Starting with the rear of the wingtip, glue to rib BR9 as you work towards the leading edge. To add some thickness to the wingtip, position and glue balsa wingtip parts #24T/B to the top and bottom of the wing tip #22. Slightly, sand a contour to the wing tip. This completes the bottom wing.

Top Wing

The top wing goes together very similar to the bottom wing. The top wing will be built in halves, joined; making the wing one piece. Note that the top wing is flat. Take your time and keep the wing flat and warped-free. Note that each rib has a bottom tab that will be removed prior to adding the rib capping. The spar webbing is pre-cut and numbered for you, so, the wing will go together like a puzzle. Don't be concerned if the spar webbing numbers are visible or not when positioned; but just insure the arrow is pointed towards the ceiling. The spar webbing is design to be flush with the top and bottom of the rib, making the spar/webbing the full vertical length of the rib. As you put the pieces together remember this as it will help you ensure that the parts are positioned correctly. The ailerons will be added after the top wing is joined and finished.

Some things to remember -

11. The plywood spar webbing is exactly cut to the proper size.
12. The spruce/balsa spars seat all the way down into the rib.
13. The rib capping will go over the spars.
14. Work from the inner wing (root) towards the wing tip.
15. The rib bottom tab will be removed before rib capping.
16. Point all spar webbing arrows toward the ceiling.
17. Double check spar webbing before gluing.
18. The top of the wing is flat.
19. Saw-tooth plywood is added second to last.
20. Keep the wing flat and straight.

The spar consists of two pieces. The top of the spar is balsa #38 and underneath that is spruce #54. The bottom spar is identical to the top. The balsa spar #38 will be added after all the spar webbing is in place. The top of the rear spar and maybe some of the top front spar might need some sanding as the contour of the rib slopes downward towards to trailing edge. Locate all ribs TR1-12, spar webbing X1-22, V1-22 and spars #38, 54. You need to build a left and right wing panel, start with either. Roughly position the ribs and spar webbing on the plans. You will start building with ribs TR1-2 and then rib TR3 continuing towards the wing tip inserting the front and rear spar webbing as you go. Note that the spar should extend to the right or left of rib TR1 so, when the wing halves are joined the two spars connect. Keep the top of the spar webbing level with the top of the rib and keep the ribs seated down on your building table. You want the wing flat. Note the spruce spars #54 might need slight sanding to fit into the ribs. Make sure the spruce spars #54 is seated all the way down into the rib. The spars passing the wing tip rib will be trimmed off later. You will notice an "arrow" on all spar webbing; this indicates that this end is up. Insure you have all the

"arrows" pointing to the ceiling as you glue the webbing into place. Take your time, if the ribs get out of position you will have issues with the saw-tooth plywood and rear trailing edge. In-between ribs TR3 and TR4 you need to position the wing fitting supports #28. Position the spar webbing X9 and X20 with support #28 on the inside, reference plans. Insure that the holes line up, you might test fit a screw #103 into the holes. Once satisfied glue those pieces into position. Repeat this step with the rear spar webbing V9 and V20. Note that the wing fitting #204 will be added later. You should now have the ribs, spar webbing and spruce spar glued in position. Add the stringers #21 and #30 to the wing. Trim all stringers and spars that go beyond outer rib TR12. Add the trailing edge #7, #31 in position. Glue trailing edges #7, #31 in position. With the one wing panel semi-built, build the other wing panel as you did above. Notice on the plans where the two wing panels join. Keeping the two wing halves flat and straight; join the wing halves and glue the center spar webbing L1-4. The wing should be straight and flat on the table. The rib feet will help ensure the wing is at the right height. If the wing is slightly out of alignment, you can probably fix some minor mistakes with the covering and N-struts. Position and glue rib noses TR3A, TR8A to both sides of the rib TR3 and TR8. These rib noses will help support the saw tooth plywood. Add the balsa spars #38 now. Do not cover where the n-strut fitting #123 will go. Remove the feet from the bottom of the ribs. Using a T-type sanding bar, sand the spars to the contour of the rib. Carefully, do not sand into the ribs. The saw tooth plywood is applied before rib capping and it comes in five different sheets. Start with the center saw tooth plywood #142. Reference the plans and test fit into position. The plywood should line up with the ribs. Remember the plywood is laser cut exactly so, you might have to adjust this plywood if needed. You must "wet" the plywood before adding it. This will soften the wood so it can be wrapped around the leading edge without cracking. You can add a little ammonia into the warm water which will loosen the glues in the plywood. Soak the saw tooth plywood #142 for 10 minutes in warm water. Paying attention where the saw tooth pattern stops on the spars glue the saw tooth tips to the top spar. Take your time. Using a slow glue will help you align the plywood. Start wrapping the plywood around the rib noses and glue as you go. Try to keep the plywood tight and aligned as you go. Repeat the above process for the remaining saw tooth plywood pieces. Notice where the text "top" is located on the saw tooth plywood; that end should be on the inner part of the wing, the other end should be near the wing tip. Also, the "top" means that side should be on the top side of the wing. Take your time. Locate the n-strut fittings #123. These fittings are installed on the bottom side of the top wing. Position the n-strut fittings #123. Reference the plans. Use a 1/16" drill and drill four holes for screws #122. Install all the n-strut fittings #123 with screws #122. Note that once the covering is in place, you will not have access to these screws unless you cut the covering; which is not the end of the world. Add rib capping #20 to both

sides of the wing. Try to keep the rib caps center on the rib, as the fabric rib tapes will follow the rib caps. The rib capping on TR1 and TR12 should be flushed with the outside of the rib, see the plans. Start on the bottom side of the top wing. The bottom rib caps will butt join up with the trailing edge continuing towards the leading edge. On the top of the wing the rib capping should be trimmed at the trailing edge and slightly sanded round. Keep the rib capping centered and level. The wing tips #16 go into position next. The wing tips follow the center line of rib TR12. Use a pencil to mark the centerline. I found gluing the wing tip a little at a time working from the rear towards the leading edge helps bend the plywood wing tip into position. Starting with the rear of the wingtip, glue to rib TR12 as you work towards the leading edge. To add some thickness to the wingtip, position and glue balsa wingtip parts #15 to the top and bottom of the plywood wing tip #16. Slightly, sand a contour to the wing tip. Add the wing center cut out now. Test fit the center wing cut-out plywood #26 and balsa supports #9-11, notice the left and rights in parts #9-10. The balsa supports #9-11 should be centered on the ribs and glued into place. You might have to sand plywood #26 near the wing trailing edge as it meets the trailing edge #7. Once satisfied glue in place. Mount the wing fittings #204 now. Using screws #103 and nuts #108 mount the wing fittings #204. Remember once the wing is covered you will not have access to these screw/nuts. It's recommended to use a glue or loctite on the screw threads to permanently secure these screw/nuts. You can add your servos if you want now, the proto-type had one servo per aileron. The servo cable exited the wing at the front right wing fitting #204 and then down along that tripod strut into the fuselage. Twist ties were used to secure the servo wire to the strut. The wing is now ready for the ailerons.

Ailerons

The ailerons are straight forward. Remember that the ailerons will be test fitted, but covered with fabric before permanently attaching to the top wing. Start with either the right or left aileron, repeat process for the other side. The ailerons use hinges #318 hinge which are slightly longer than the other hinges #302. You will need to assemble the control horn #298,299 and bend the hinges into shape and solder them to the brass bushing #318 as you did for the elevator and rudder. The leading edge dowel #75 might be a little too large for the telescopic brass bushing #318. You need to be able to slide the hinge assembly onto this dowel. At this time carefully sand the dowel so the hinge assemblies can slide onto this dowel without any slop. The hinges should rotate smoothly without any binding. DO NOT glue the control horn in place yet, you will do this when you test mount the aileron to the wing. Temporarily position the control horn and the three hinge assemblies onto the dowel #75. Like the elevator and rudder go ahead and secure the hinges in place

using the collars #319 and pins #109. The aileron ribs are laminated balsa and plywood. At this time glue the ribs together and sand the square-ness away from the rib edges. Locate the ribs in position on the plans with the leading edge dowel #75 in place. Glue the outline plywood, balsa parts #8, 66, 67 T/B parts together. The "B" parts go on the bottom. Maintain enough gap between the wing and aileron so, when the aileron and wing are covered with fabric they do not rub and the aileron will move freely. Note the counter balance aileron area should align with the center line of the wing tip, make sure you have that aligned before gluing ribs #131-132. Trim the dowel #75 and notice that the dowel will be slightly bevelled at the end of the aileron, sand that bevel in the dowel now. Note that the aileron outline #66-67 should be centered on the dowel. Position and glue the ribs #131-139 to the leading edge #75 and the trailing edges. Cut and glue support dowel #130 in position. Test fit the aileron to the top wing. The trailing edge #31 will need to be notched so the aileron can move up and down at least one inch either way. Create that notch so you have enough aileron movement. Cut three aluminum tube #37 pieces and glue them to the other side of the trailing edge #31. These tubes will guide the screws thru the hinges if and when you remove or install the ailerons after everything is covered. The hinges should be position such that they press against the trailing edge #31. Once you are happy with the hinges and aileron movement you can now place the aileron in the neutral position and glue the control horn in place. Remove the aileron for covering and repeat for the other aileron.

Hinges

The hinges are true scale and quite ingenious. With that said, you will find the hinge installation will provide smooth movement and no slop. Note that there are two different hinges used on this plane. They are basically the same except the aileron hinges are longer than the other hinge. You need to take your time and understand what you are trying to accomplish so you can successfully create the hinges. First, you need to assembly a hinge bender using parts #6 plywood and some scrap dowel #405. The top part of the plywood #6 has a slot in it. Cut and glue two pieces of dowel #405 so it goes covers the top of plywood #6 except for the slot. Place the plywood #6 in a vice so you can now bend a hinge #302 around the dowels #405. Center one hinge #302 over the dowels and bend down both sides. Remember that a screw will go thru the hinge hole so try to bend the hinge evenly. You now have the hinge in a "U" shape pattern. Ensure the holes line up, make any adjustments as needed. Now place the hinge over the dowels again. Notice the strap in the center of the hinge. This center part needs to bend down into the slot in the plywood #6 part. You can use a thin screw driver if you want. You might consider rounding the screw driver head so as you push this strap down you will get a curved scrap. Keep the screw driver centered. You

will see where the center strap bends over itself. Use a pair of needle nose pliers to bend that part back over the hinge. Sort of looks like a crushed center strap protruding above the hinge. You can remove the hinge and test fit the steel rod #4 into the hinge. So, you should have the center strap on one side and the rest of the hinge on the other. The hinge will wrap around the brass bushing #319; where the bushing will be inserted into this new curved strap you just made. This center curved strap is a reverse bend. You need to keep this reverse bend round so the bushing is held in place without the bushing being bent or altered. A nice snug fit is desired. Reference the photos. It might take you a little bit to form up a nice hinge. The good news is that the metal hinge is easy to form. Once you have a hinge formed go ahead and form the other hinges using parts #302 and #318. The hinge needs to be secured to the bushing #319. You should carefully do this by soldering the reverse center strap to the brass hinge. You might try using CA glue which should secure the hinge too. DO NOT get any glue or solder on the inside of the brass bushing #319. Test fit the hinge/bushing on carbon tube #229. It should fit just fine and rotate freely. Go ahead and secure the hinges to the brass bushing #319; keep the hinge centered on the brass bushing. To mount the hinge in place on a dowel or carbon tube, the hinge will be surrounded on both sides with brass collar #320, then you will secure those collars in place with the brass pin #109. When you are ready to mount a hinge in place, put two collars #320 one on each side of the bushing #319. You want a slight gap between the bushing and collar so you won't have metal to metal rubbing. You can put masking tape on the collars keeping everything in place. Using drill bit #53 carefully center drill the collars and insert a pin #109. CAREFULLY, glue the outside of the collar (away from the bushing) to the carbon tube or dowel. Trim the brass nail and file the end. Repeat for the other collar ensuring that the hinge can move freely. If desire, you could add a little oil after you have completed the plane. This completes the hinge assembly.

Rudder

The rudder is fun to build and there is a sequence in building the rudder. You will laminate the rudder outline, create the control horn and hinges and then assembly these parts as well as the rudder ribs. Place the two cardboard outlines #93 together using some masking tape, be careful as the cardboard edges are sharp. The rudder outline is a mix of plywood and balsa parts. The parts #42 and 43 laminated in a order. The balsa #42 stringers are on the outside and the center of the lamination. The plywood #43 will be sandwiched in-between the balsa. Soak these wood parts in warm water for 5 minutes. This will help the wood bend around the cardboard outline. You can join these wood parts on top of some wax paper so when the wood is held in place against the cardboard outline it

won't glue to the cardboard outline. Using wood glue, not CA, laminate all the pieces together. Place one of the balsa parts #42 on a flat surface, brush some wood glue on the top of that. Now add two of the plywood #43 parts (12 and 24-inch long) on top of the balsa #42. Add another balsa #42 layer, add another plywood #43 layer and finally add the last balsa #42 layer. Make sure the lamination is straight and aligned and now insert one end of the lamination in the front slot of the cardboard and wrap the lamination around the cardboard outline. Use masking tape to secure the lamination against the cardboard. Ensure the lamination is flat, aligned, smooth against the cardboard. Set aside to dry. Locate two FR4 parts #296 and #297. These parts are a little messy since they have been laser cut. One thing to notice here, the center hole is offset a wee-bit, creating a thinner wall on one side of the center hole. So, when you place the control horn on the rudder post (carbon tube) ensure that the thinner wall points forward toward the pilot. This will keep the control horn n-sync with the hinges. Now join these parts having the two inner #296 part in the center and the two outer parts #297 on the outside. Use a slow CA glue which will give you some time to align the center hole and ear tabs. Once you have these parts joined and glued you, use a 1-inch belt sander or something similar and twirl / twist the control horn against the sanding belt to get the airfoil shape desired. Use a file or carefully sand under the tabs creating a straight line. This is where the original was welded, so, you are trying to recreate that feature. The rudder ribs #19,41,44 and 45 are laminated together like the rudder outline. The balsa parts on the outside and the plywood part on the center. Align and glue the rudder ribs together. Slightly sand the ribs giving them a airfoil outline. The two hinges #302 need to be created before you final assemble the rudder. Bend two hinges to shape. The rudder post is a combination of the brass tube #230 and the carbon tube #229. Cut a 3-inch long piece from the brass tube #230. Insert this in one end of the carbon tube DO NOT glue yet. Lay the balsa outline and ribs on the plans. Notice where the ribs attach to the rudder outline. Make a notch in the laminated outline for the rudder ribs. This will help secure the ribs to the outline. Just notch the first layer of balsa. Place the ribs on the rudder post (carbon tube) and glue them in position. Glue the outline to the ribs but DO NOT glue the rudder outline to the bottom of the rudder post (carbon tube) as you still need to add the hinges and control horn. Cut reed #56 into two pieces. This part will go from the front of the bottom rib to the bottom of the outside of the rudder outline going over the rudder post. You are trying to simulate the metal tubing used for the rudder rib and outline. Sand and glue the reed in place. Looking at the rudder drawing you will notice that one hinge is above the control horn. Locate the related hinge parts #109, 319 and 320 placing them in position. The hinges are exact scale. You need to add the top hinge first and the bottom hinge will be added when you mount the rudder to the fuselage. The hinge is on a bushing #319 and is secured in place by two collars #320. This keeps the hinge from sliding

up or down the rudder post. The collars #320 are pinned in place. It is CRITICAL that you do NOT get any glue under the bushing as it will just about weld it to the rudder post (carbon tube). You will have to scrap your work. The brass pins will secure the collars in place so, no glue should be needed in this area. Also, note that the center hinge strap has a reverse curve which helps secure the hinge to the bushing. Using CA glue, carefully glue the center of the hinge strap to the bushing. Using #53 drill one hole in each collar for the brass pin #109. You should have a slight gap between the collars and the bushing which prevents any rubbing between these parts. Add a little CA glue to the pin #109 and insert that into the collar. Trim the pin to length. The hinge should move very freely add a little oil (WD-40) under the bushing if desired. Ensure you have the control horn oriented properly, perpendicular to the rudder and the thinner side of the center hole pointing forward, glue the control horn in place with some CA glue. Slightly crush the brass tube where it connects to the rudder outline making it the same thickness the rudder outline. Now glue the brass tube to the carbon tube and rudder outline. This completes the rudder for now as you will add the bottom hinge when you locate the rudder on the fuselage. At which time you will permanently add the bottom hinge and glue the bottom of the rudder outline to the rudder post. Plus, you can sand the rudder outline to shape giving it a little airfoil shape.

Stabilizer

The stabilizer should be built on a flat surface and over the plans. No real magic to building the stabilizer but ensure you have good glue joints. Follow the plans and assemble the stabilizer. The ribs go together like the rudder ribs, in that, plywood is laminated between two balsa pieces. Glue the stabilizer ribs together. Slightly sand a curve on each side of the ribs removing the square edges. Place and cut the trailing edge dowel #75 to length. Position the ribs on the trailing edge and glue in place. Keep the ribs vertically straight, level and flat. Add the inner and forward dowel support #75 through the ribs securing it to those ribs and the trailing edge. You might consider waiting until the fuselage is framed up before you add forward ribs #25 and outer dowel #77. The reason is you can adjust the distance between these ribs and the fuselage longerons. Ensuring that the gap between these parts is satisfactory before adding the fabric. If desired, add the ribs #25 and the outer dowel #77 to the stabiliser gluing them into position. This completes the stabilizer for now. The stabilizer will need to be fitted to the fuselage and at that time you will finish the stabilizer by locating the drill holes securing the stabilizer in position. This completes the stabilizer for now.

Elevator

The elevator should be built on a flat surface and over the plans. The stabilizer should be built before the elevator so you can "fit" the elevator to the stabilizer. Like the rudder the elevator outlines are laminated. Same concept using balsa and plywood parts. Soak the balsa and plywood parts #59 and 79 in some warm water. Using wood glue laminate these parts (like the rudder) having balsa on the outside and one in the center. So, the lamination goes, balsa-plywood-balsa-plywood-balsa. Once you have the parts glued, wrap the lamination around the cardboard outline #94 using masking tape to hold the lamination in place. Create both elevator outlines. Once they are dry, remove the laminations from the cardboard and carefully sand a curve in the laminated outline. The ribs are just like the stabilizer and rudder, in that, plywood is laminated between two balsa parts. Keeping the ribs aligned, glue the elevator ribs together. Slightly, sand the rib edges giving the ribs a little curve getting rid of the square edges. The control horns are the same as the rudder #296 and 297. Create two control horns as you did in the rudder. Sand the control horns too. Remember that the thinner side of the center hole will face forward towards the pilot. Three hinges are used on the elevator. Bend three hinges #302 to shape. Place the carbon tube #205 on the plans. Remember you are using scale hinges, which means there is now a sequence to assembly. In that, the hinges and control horn need to be secured and located prior to adding the elevator ribs. Position the hinge #302, related hinge parts #319 and 320 and control horns on the carbon tube #205. Make sure you have the control horns oriented correctly in regards to the thin center hole wall. Test fit this assembly to the stabilizer. Once you are happy with the hinge locations, glue the hinge to the bushing. Use #53 drill bit and secure the hinge collars to the carbon tube using brass pin #109. Make sure the hinges move freely. The control horns will be glued in position after the ribs are positioned and glued. Cut two 4-1/2 inch pieces of brass tube #230 and insert one in each end of the carbon tube. DO NOT glue in place yet. Test fit the laminated outline and ribs onto the carbon tube. Notch the balsa in the laminated outline like you did on the rudder for the elevator ribs. Position and glue the elevator ribs to the carbon tube and outline. Before you glue the forward rib #71, test fit that rib in place while the elevator is temporarily positioned to the stabilizer. This way you can ensure you have the correct gap and rib angle. Once your satisfied with that glue rib #71 in place. Go ahead and notch the outline where the brass tube #230 will be positioned. Crush the ends of the brass tube to the same height of the elevator outline. Glue the brass tube to the carbon tube and the laminated outline. The control horns can now be glued into position. Ensure the are perpendicular to the elevator and you could test fit the elevator to the stabilizer helping the alignment. Once your happy with the control horn position and angle use some CA glue and secure them in

place. Place the elevator onto the stabilizer. Cut two small notches in the stabilizer trailing edge dowel for the control horns. Mark the three hinge hole locations on the stabilizer trailing edge. Drill three 1/8 inch holes for the hinge screws at these mark locations. Test assemble the elevator onto the stabilizer. Ensure the elevator moves freely. Make any needed adjustments. This completes the elevator.

Subwing

The subwing is straight forward and the incidence (zero) is taken care of for you. Glue the two plywood ribs #32 together, keep the holes aligned. The struts will mount to the inside of these as well as the cross bracing cable fitting #309. The box spar parts #34, #35 snap together. Glue the box spar #34, #35 together. Cut the axle to length for the wheels you plan on using. If you are using Dubro wheels 9-3/8" with Dubro wheel collars the axle will be 27-5/8" to 27-3/4" long. Cut the axle to length for the wheels you plan on using. Dry assembly the ribs #23, 32 onto the spar box; then add the dowel #47 thru the ribs. Once satisfied with their location glue them in place. Trim nails #33 to length and epoxied into position on the rib #32, these nails support the bungee cords. The bungee cord #702 system is functional and is required for landings. Once the subwing is built access to the bungee cord will be limited; although, you can create two access doors on the bottom if desired. You need two nine inch pieces of the bungee cord. The aluminum tubes #711 are used the crimp the bungee cord into place. Using the tubes and bungee cord, wrap the bungee cords around the nails and crimp with the tubes #711. The bungee cords should be tight enough for some shock effect with the axle, don't over tighten them. Test fit the struts #307, 308 in position. You might have to adjust the struts to get them to fit. Use screws #116 to hold them in place. You need to cut slots in the upper plywood covering #39. The trick I found was to use a pencil and mark the inside of the rib #32 where the struts exit the rib. So, when the plywood covering #39 is in place you will know where to cut the slots for the struts. Mark the locations of the struts on the inside of rib #32. The struts should be test fitted to the belly of the fuselage. You might need to bend the struts a little to get them properly positioned. Once satisfied with the angle of the struts, it's time to install the music wire #310. Insert some cotton into each landing gear strut. This will prevent the JB Weld from running down the strut. Follow the instructions on the JB Weld and mix up a batch and add it into the strut ends. Add the music wire #310 where the shorter end goes into the end of the strut. Wrap the ends of the strut and music wire with some masking tape. While the JB Weld is setting test fit the struts to the fuselage. This should align the music wire to the right angle. Let the JB Weld set over night. Remove the struts, you might want to paint them now before they are permanently set into the subwing. Position and slow glue the top plywood covering #39

in place. Start in the rear and work your way forward, keep the plywood centered on the subwing. The outside rib #106 will be added later. Cut the slots in the plywood for the struts, don't make them too large. The landing struts at this time should have the music wire added and they have been test fitted to the fuselage belly. The struts are intended to be mounted to the double ribs #32 semi-permanently, in that, you should not need to remove them unless you have a mishap. So, use a Loc-tite to secure the screw/nuts holding the struts in place. Position the fitting #309 on the inside of the front struts #307. Using screws #116 and nuts #108 secure the struts in place. Add the outside rib #106 in place. Glue the bottom plywood #36 in position. The subwing is covered and the struts are installed. You can paint the subwing the olive green color now. I finalize the paint with a coat of gloss polyurethane. Before you add the turnbuckles and cable to subwing the fuselage should all but be covered. As the landing gear struts should be mounted with the j-bolts, the bottom belly shroud should be in place, and the struts #315 should be in position. Add the turnbuckles #709 to fitting #309 using screw #40. You should use loctite to keep the nut #108 from coming loose. You should twist the turnbuckle so it extends out a decent amount. This way when you twist the turnbuckle tight it pulls the cable tight too. The cable #708 is functional and it is very important to keep them guitar tight. You should check the tension before each flight. The cable goes around the strut #315, so, when the cable gets tight it will pull the struts inward. Cut the cable to length and add the swage #720. Crimp the swage tight. Thread the other end of the cable thru another swage running the cable thru the turnbuckle and back thru the swage. Pull the cable tight and crimp. Adjust the turnbuckle #709 and secure the adjusted turnbuckle with the safety wire #80. The subwing is complete.

Fuselage

The fuselage is rather straight forward and goes together relatively easy. At this point you need to decide on your engine, reason being, the location of the firewall. The prototype used a gas engine, ZDZ-80 twin, which is shown on the plans. You can slide the firewall a little, just try keeping the strut locations where they are. As you build the fuselage try to keep any twists or warps out of the fuselage; if you do get a twist you might be able to un-twist it when you add the fabric. The glue used on the prototype was a wood glue such as, Tite-bond and epoxy at certain locations. Seems like CA type glues do not work well with spruce. If desired, you can add gussets throughout the fuselage to ensure the vertical or horizontal members are well connected to the longerons. The prototype did not have these added, it's more of a personal preference. Try making all joints square and keep the fuselage flat. The plans show that the vertical members are slightly notched into the longerons. I

found this very helpful. You might consider doing that. Note if you are building with dowels the process is the same as if you were going to use square sticks. The fuselage is designed with 5/16 inch parts. You need to glue the following pieces together using wood glue and set aside to cure. Locate parts #27,27A,81,81A,91,91A,92,92A,97 and 97A. Align the parts together and glue. You might want to put a book or something that can add pressure to these laminations as it dries. Notice on the plans that the fuselage is square up to the pilot seat and then it starts curving back toward the tail. You need to make two fuselage sides now. Notice on the plans where the longerons start. They support the plywood cowl parts #48,49. Use those parts to help align a starting point and then add the side plywood 97,97A and work your way back toward the tail area making two fuselage sides. Plywood parts 91,92 are notched to help ensure that you have parts located correctly. One important area is where the bottom wing will fit. You should get your fuselage members in this area shown like the plans. You should now have two fuselage sides framed up. You can slightly pick one up and twist it a little bit to ensure you have a solid glue joint. You should work your way from the front to the back. Next you should glue the strut supports and firewall in position. This will square up the front and align the fuselage halves together. If desired, you cannot glue your firewall yet and just position it in the framework to help square the parts together. Use epoxy and glue in the three strut supports #50 and the landing supports #98,99. The framework should be square now. Working from the cockpit area towards the tail, position and glue the horizontal supports #405 in place. Remember to keep everything straight and no warps. You are sort-of building a oil derrick. Working toward the tail you start seeing the fuselage members being stressed a little as the curve back. This will be a good time to ensure everything is glued well and if you want to add gussets to your joints. At the tail area is part #407. This is there to help you align the tail as well as support the screw for the stabilizer. You will need to sand the fuselage sides at this area to get the proper size for the rudder post and joint. Position and glue #407 in place and sand as needed. You should now have the fuselage framed up and without much warping. You can now start adding some support parts. Glue bungee support #325 in place; reference plans. Glue the two triangle parts #27 and #81 in position if you have not already done so. Position and glue front hood support #58 and add turtle deck arch #82. Follow the pilot seat instructions and add the seat frame to the fuselage. Glue and position the tailskid post #322. You will probably have to sand the longerons a little to get this part in position. The goal here is to have a solid joint as this area will take some testing as you land your plane. Glue the turtle deck tab supports #3 to arch #82. You can use the turtle deck #65 to help locate the front two tabs #2. You should have all turtle deck tabs glued into position. Glue and position cowl supports #48,49 in place. You are at the point now to paint the fuselage. The prototype was painted green FS 34102 like the originals. If desired, you can paint the frame now the green or even a

polar grey would be fine. Back at the tail area you need to install the bolts that will hold the stabilizer in place. There are three. At this time position the stabilizer in place. Make sure it is centered and straight. You can measure from the front of the fuselage to the outer tips of the stabilizer to see that it is equal on both sides. Locate the back center hole needed for the screw #116 in triangle part #407. Drill a 1/8" hole at this position and install the #116 screw upside down meaning the threads should be pointing toward the ceiling when installed and when the fuselage is sitting upright. You should glue this screw in place after you are satisfied with it's location. The two front threaded rods #105 should stick above the stabilizer about 3/16 inch. Remember you still need to cover the fuselage and stabilizer, that will add some thickness. Drill the two 1/8 inch holes for the threaded rods #105. Remove the stabilizer and glue the rods into position. At this time install the tail skid, which is made out of ash like the original. You will have to sand and cut the tail skid to shape. Do not sand to much around the fitting area, let that stay sort-of flat, as you will want the tail skid fitting to be snug. Too much sanding in this area will prevent that. Locate fitting #343 and wrap the fitting around your tail skid. It needs to be a snug fit. Remove the tail skid fitting #343 and drill the two 1/8 inch holes near the top of the tail skid on 3/4 inch center about a 1/2 inch from the top. These holes are for part #207. At this point you should stain you tail skid a clear or a early American stain. You could use a polyurethane paint if desired. Cut a 3-inch piece of wire, remove the plastic covering and bend the wire around a round surface like a dowel. Insert the wire into the top two holes and bend the wire ends over like it is shown on the plans sheet 1. Trim any excess wire. The tail skid fitting should be painted the same color as the struts and fuselage. At this time paint the tail skid fitting. Add the fitting to the tail skid by using screw/nut #103, 108. The tail skid post #322 needs to be drilled for the tail skid fitting. Use a 1/8-inch drill and drill the hole needed for the tail skid fitting. Next mount the tail skid with nut/screw #103,108. Cut a six-inch piece of bungee cord #702, tie a knot in one end, then run it thru plywood support #325, tailskid and back thru support #325. Keep it semi-tight and tie another knot. The tailskid should have spring action. You can test fit the rudder now. You will need to slot the rudder post for the control horn and drill two 1/8 inch holes for the hinges. Do that at this time. The rudder should move free with no binding. With the subwing done you should mount the fuselage to the subwing. The landing gear struts are held in place with two j-bolts #301 per strut. Position the landing gear struts into the grooved blocks #98,99. You want the j-bolts to hug the music wire #310. You can easily do that if you drill 1/8 inch holes almost touching the music wire when in position. The j-bolts should be about one inch apart. Remember not to get the j-bolt to close to the longeron as you will have to be able to put a wrench on the j-bolt nut and if it is too close to the longerons or vertical members you won't get a wrench on the nuts. Mark the hole locations for all eight j-bolt locations. Using a 1/8-

inch drill bit, drill straight 1/8 inch holes. Mount the landing gear at this time. You should have the subwing centered. You might have to slightly bend some of the landing gear struts to get everything just right. Remember that the landing gear will use a cable which can help align things if needed. Place the stabilizer in position. You can add the stabilizer aluminum struts #713 now. These struts should be painted the same color as the tailskid fitting and the other struts. You will need to flatten the ends and drill a 1/8-inch hole on one end and a 3/32 inch hole for the fuselage screws #122. Use screws #318 to mount the struts into the bottom longerons and bottom of the stabilizer. You can fit the bottom wing to the fuselage now. Test fit the bottom wing in place. The wing fittings #305 should be painted the same color as the struts, you might want to paint them before permanently mounting them. Add the fittings #305 in place on the bottom wing and position the bottom wing in place. Measure the fuselage to the wing tip on both wing sides, measurements should be equal or real close to each other. Once satisfied, mark the four hole locations onto supports #27 and #81 plus mark the hole locations for the wing fittings #305. Use a 1/8-inch drill bit and drill all the locations. Remove the bottom wing and install fittings #305 using screws #103. You will have access to these screws when the wing is removed from the fuselage. Remount the bottom wing to the fuselage, this time adding screws #227 in the bottom wing fitting #305. Before you mount the top wing. All the struts involved should be painted the same color as the landing gear struts. You might want to paint these struts before you permanently mount them. Mounting the top wing is not all that hard but it will take some time to fit everything. Supporting the top wing above the fuselage is probably your biggest effort. The top wing uses zero-degree incidence and is parallel to the longerons. A slight positive incidence should have a minor effect. The bottom of the top wing is about 7 inches above the top longerons. You should test fit all the struts and wing to get everything aligned and ready for permanent mounting. You will need to bend the strut tabs some to help get the struts in their correct position. Once you have the struts temporarily placed then you can mount them using the JB-Weld and finalize their position. You will need to drill a 9/64-inch hole in the rear wing struts once you have everything else aligned. Remember the wing is held in place using four 6-32 screws. The main goal is to have the top wing mounted straight and centered. Reference where the top wing leading edge begins over the cowling. This does take some time and accuracy and patience are required. First, you need to drill two 3/16 inch holes into the fuselage for the rear wing strut #316. Notice on the plans where the strut #316 enters the fuselage. It is at the bottom right of the plywood support #97. Drill the two 3/16 inch holes needed for these strut. Use a scrap piece of wood to help support the top wing and maintain the proper height above the fuselage. Install the bottom tripod struts #315 and the rear wing struts #316 first. The bottom of strut #315 will join the front landing gear struts #307. The music wire #310 in the landing

gear strut #307 will be used to hold the bottom tripod strut #315 in place. Reference plans. If you have the subwing mounted, unloosen the j-bolts and add strut #315. Make sure you have the strut oriented right in that the streamline section (widest) is pointing forward. Now use screw #228 and hold the strut #315 to the top wing. The music wire #336 should have the shorter end be inserted into the strut and the longer end into the fuselage. Insert a piece of cotton into the strut end #316 and then insert music wire #336. The music wire #336 mounts to the top of support #50, see plans. Also, note that this strut should bend out away from the fuselage a little because the fabric will be coming into this area as well as the side fairings. Position the strut ends into the top wing fittings #204 without drilling for now. Add the two remaining tripod struts #326,327. You will probably need to bend the tabs to locate the struts. You can add the music wire #335,338 to the struts seeing how they lay on top of strut support #50. Try to get the music wire centered on the strut support. If the music wire is at some angle that is ok too. The goal here is to be able to secure the struts to the fuselage. With all the struts temporarily in place, measure the wing tip to the fuselage and align the wing with the tail. The wing incidence should be zero when the wing and fuselage are level. Use a incidence meter for assistance. Once satisfied with all the alignment add JB-Weld to the inside of strut #316 and masking tape over that holding the JB-Weld and music wire #336 in position. Add JB-Weld to the tripod struts #326 and #327 with music wire #335 and #338. Use masking tape around the music wire end of the strut which will keep the JB-Weld inside the strut. Let dry overnight. Using a 9/64-inch drill bit, carefully drill thru the wing fittings #204 and the struts. Recall rear tripod strut #327 was not drilled nor was rear wing strut #316. Add strut straps #314 about a 1/2 inch from the outside longeron edge. This strap will hold struts #326, #327 and #316 in position. Re-check the wing alignment. Make any adjustments as needed. Glue turtle deck supports #82, #83 and #84 in position. Glue hood and cockpit supports #57 and #58 in position. Add the turtle deck #66 and the cockpit opening #90. The cockpit opening plywood rear edge should butt join the turtle deck over the center of #82. Once satisfied with their location, glue into position. You might consider adding your gas tank and radio gear now, as the next step you will add the side fairings. Glue and position the two balsa support #187 to the back side of cowl support #48. Now add the two balsa supports #37, #56 in their respective positions, reference plans. Glue and position stringer #30 into supports #187, #37 and #56.

The side fairings are two pieces just like the original. The piece with the holes in it will go on the lower part of the fairing. The first hole is for strut #316 and the second is the carburetor intake found on the original plane. The first hole might need a little adjusting, depends where your struts ended up. Start with the top half of the fairing and position that such that the bottom fairing edge is centered on stringer #30; leaving room for the other half to be glued to #30. Once satisfied, glue the side

fairings #66 in place, do both sides. The fuselage handles #207 is easy to add and it is recommended they be put in after the fabric is installed. You will drill four 3/32 inch holes for the handles into the longerons. The handles should be painted grey, after you strip the covering off the wire and they are cut to length. The same goes for the foot step #208. You can add it at the same time and drill two 3/32 inch holes. Notice that the step goes on one side (port) only. The belly door #60 and shroud #61 can be added now. Notice that the screws #318 holds the door in place. Add the door support #405 to the inside of the belly area, see plans. The door supports #405 will have the screws #318 screwed into it. Position and glue the shroud #61 in place and then add the door #60 using the screws #318. Position your machine guns next. Temporarily, position the top hood #69. You might need to notch the top hood #69 for the struts, do as needed. Position and glue the top hood #69 into place. Using spruce sticks #299, make the n-struts pieces. Note that the ends of the n-struts are slotted. Use a saw and slot the ends of the n-struts. Insert the plywood pieces #88, #87 and #89 into their respective places. The leading and trailing edges of the n-struts should be sanded round. Use wood glue and assembly the n-struts. Position the n-struts in-between the wings, align and drill a 1/8-inch hole into the n-struts and add screws #227. This completes the fuselage.

The Final Touch

The D6 was covered in lozenge fabric. The wings were usually 5-color as well as the fuselage. Although, some planes had a mix of 4-color fabric. Decide on your model and obtain the fabric or you can hand paint the polygons if desired. The CG is located on the plans, the plane should be a little nose heavy, meaning it should point down when holding it at the CG location. Flying the D6 is a pleasant experience. On take-off keep the tail up and use some right rudder and you'll see the plane lift off within fifty feet. You should not over correct the control throws, in that the plane reacts well to little movements, so, having dual rates active will help you. Landing is straight forward, this plane will not glide in as a Cub would. You need to "drive" it in with some throttle. Land on the two front wheels then as it slows down lower the tail and roll to a stop. This plane was known as a "pilot's plane" because of all the nice features and flying characteristics. Enjoy your model and send us photos.