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My House of Balsa 2x6

by Alyssa V. Wulick



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Introduction

My name is Alyssa Wulick and I live in Gig Harbor Washington. I am seven years old (almost eight) and I just finished building my first wood sailplane. It is called the 2x6 and it's a kit made by House of Balsa.

The 2x6 has a six foot wing span and is supposed to use two servos, so it's just like my Highlander. I have a hard time taking my Highlander to the flying field because it has a one piece wing, so I decided I wanted the 2x6 to have a three piece wing. I also wanted simple dihedral instead of polyhedral. I made some other changes, too. I used four servos instead of two because I wanted ailerons, and I also made the trailing edge straight so the wing tips sweep back.

What Papa did first

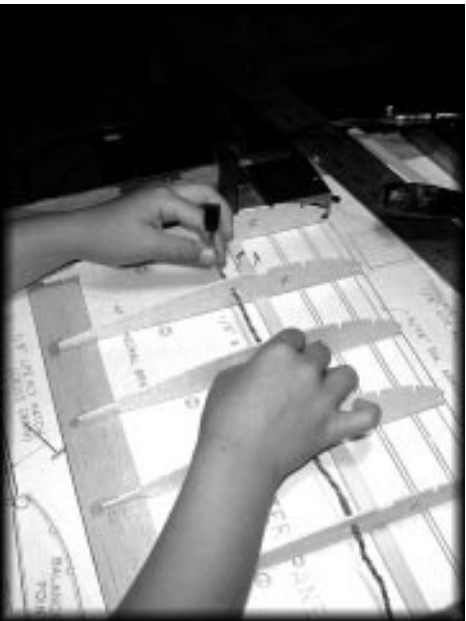
Before I started building the 2x6, my Papa cut an inch off the front of the nose and cut the top of the fuselage into a nice curve. Papa also drew the new swept back wing tips and square stabilizer tips on the plans.



I built the tail before the wing because I needed to learn how to cut wood with an X-Acto blade and a single edge razor blade, and how to work with CA glue.



The aileron ribs were cut from the wing ribs, and the ailerons are fully sheeted.



Starting at the servo, the wiring goes out through the wing tip root rib behind the spar and connects to a Y-harness in the center section. The Y-harness wiring to the receiver goes through a hole in the bottom of the center sheeting.

After marking the bulkhead locations on the fuselage sides, I glued in the bulkheads and used machinist blocks to make sure they were square.

Fuselage

The plans show a weird way of putting in the radio gear — battery, servo, receiver, servo. I decided to keep the battery between bulkheads 1 and 2, and put the receiver between bulkheads 2 and 3, and the rudder and elevator servos right behind bulkhead 3.

I used JR 341 servos for this airplane. These servos are much smaller than the servos shown on the plans, so I drilled holes in the bulkheads for the pushrods. After the servos were glued to the fuselage sides, the servo arms reached the pushrods just right.

After marking the bulkhead locations on the fuselage sides, I glued in the bulkheads and used machinist blocks to make sure they were square. I used machinist blocks when I put the fuselage sides together, too.

Tail

I built the tail before the wing because I needed to learn how to cut wood with an X-Acto blade and a single edge razor blade, and how to work with CA glue.

I didn't like the style of the stabilizer and elevator. Papa drew lines for square tips on the plans, so I just followed the new lines while I put together the framework. Instead of



I painted the fuselage. I sprayed on a coat of primer first, and sanded it down with a foam sandpaper pad. Then I sprayed on two coats of white.



balsa sticks, I used spruce sticks for the trailing edge of the stabilizer and the fin because spruce is much stronger than balsa.

Cutting the diagonal ribs for the tail was tricky because of all of the angles and different lengths.

Wing

The wing was supposed to be one piece with polyhedral and no ailerons. I thought a three piece wing would be easier to carry, and I also wanted ailerons. I had to build four wing panels - the two wing tips and two center panels.

Building the wing was complicated. I had to use the dihedral braces from the wing tips to make the dihedral in the center section. I also had to make four wing rods and glue brass tubing in the wing spars and near the trailing edge.

I used machinist blocks to make sure the ribs were glued in straight.

The most difficult part of the wing was the ailerons. The aileron servos are mounted in the wing tip, right behind the spar on a small wood platform. The aileron ribs were cut from the wing ribs, and the ailerons are fully sheeted. The trailing edge of the wing in front of the aileron has three pieces of 1/16th inch balsa sheet — upper, lower, and vertical — so it looks like the letter C.

All of the wiring in the wing is twisted. Starting at the servo, the wiring goes out through the wing tip root rib behind the spar and connects to a Y-harness in the center section. The Y-harness wiring to the receiver goes through a hole in the bottom of the center sheeting. I use pieces of electrical tape to keep the loose wiring against the bottom of the wing and away from the elevator and rudder servos.

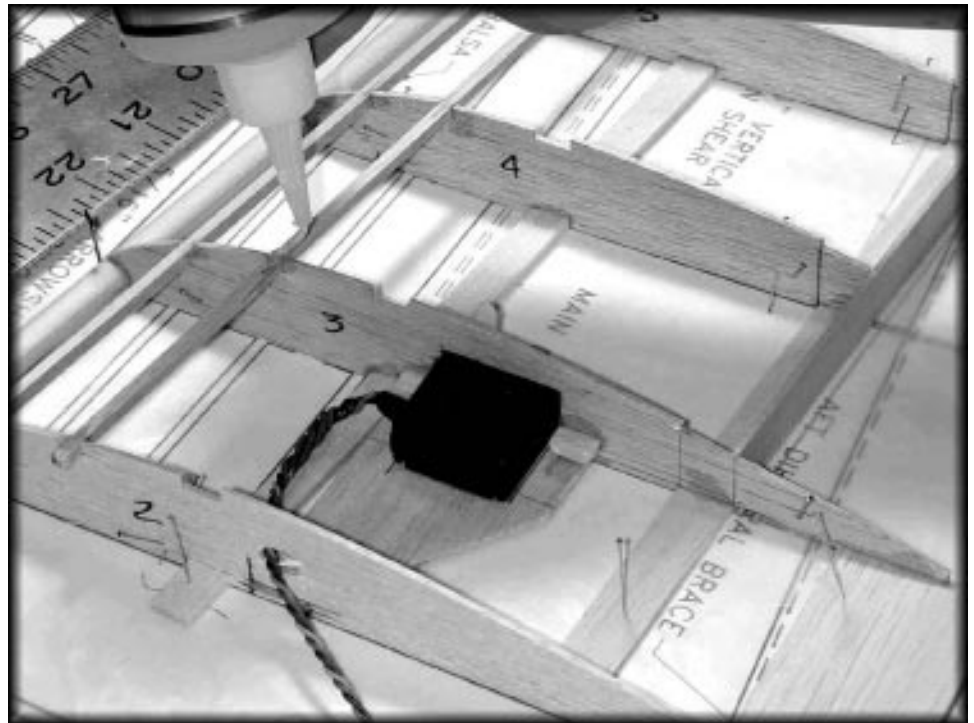
Radio

The battery just fits in the first compartment, but there's lots of room for the receiver and wiring in the second compartment. Papa had a small switch which I put into the right side of the fuselage next to the receiver.

I glued in all the servos with Goop. I had to take a servo out, and it just



I used machinist blocks to make sure the ribs were glued in straight.



The aileron servos are mounted in the wing tip, right behind the spar on a small balsa wood platform.

A note from Papa: Alyssa's 2x6 project turned out to be one of the most gratifying experiences I've had in a very long time. Mentoring her construction of the 2x6 was a fantastic experience. Not only did I get to spend a substantial amount of time with Alyssa, which I always appreciate, I watched her learn basic aircraft construction techniques and gain fundamental critical thinking processes (planning ahead and making decisions based on predicted outcomes). Witnessing the joy on her face every time her creation takes flight is truly indescribable. She already has her next construction project in mind, and I'm very much looking forward to the adventure.

popped off the Goop after I pried it with a screwdriver, so I think my way works pretty good.

Covering

I painted the fuselage. I sprayed on a coat of primer first, and sanded it down with a foam sandpaper pad. Then I sprayed on two coats of white.

The wings were covered in Monokote transparent green. The fin and rudder and stabilizer and elevator were covered in transparent yellow. I used the Monokote to make all of the hinges, also.

Flying

I checked the center of gravity and made sure it was where the plans said it should be. That's 1/8th inch in front of the back of the spar. Papa took us out to the Howe Farm in Port Orchard for the test flying.

Papa did the test flying. It flew down the slope in a straight line and just needed a few taps on the elevator for a perfect landing. When we tried turning the 2x6, the ailerons were really sensitive, so we turned the knobs on the transmitter so they wouldn't move so far. Papa threw it into the air and I flew it around in a big circle and almost landed at my feet, so I thought it was flying great.

At 60 Acres, Papa and I did some more hand tosses across flat ground. It turned out to be nose heavy, so I started taking pieces of lead out. The center of gravity ended up being a half inch behind where it's shown on the plans. I think this is because the wing tips are swept back two inches.

I wanted to put the 2x6 on the winch, but Papa said he didn't think it would handle that kind of launch. I finally talked Papa into launching it from the winch, and it went up just fine. After a few launches it was doing great zooms.

My 2x6 climbs in light thermals and turns in very small circles. Several Seattle Area Soaring Society club members have flown it, and they all think it flies very well.

The box for the 2x6 says "4 to 6 hours assembly time," but it took me almost four days to build the kit. I think it



I think the 2x6 would be a great trainer. I learned a lot about building with wood, it's a very sturdy airplane, it looks good, and it flies awesome.

took a long time because of all of the changes I made, like using four servos, making a three piece wing with dihedral, and making ailerons.

The box also says the 2x6 has 590 square inches of wing area and should weigh 30 ounces with standard radio gear. This makes the wing loading about 7.3 ounces per square foot. My 2x6, ready to fly, weighs 31 ounces. I think this is pretty good.

I think the 2x6 would be a great trainer. I learned a lot about building with wood, it's a very sturdy airplane, it looks good, and it flies awesome.



The wings were covered in Monokote transparent green.