**Crafting the Hand Ranch 1500-2**

http://home.t07.itscom.net/kajie/DLG-1500-2.htm

http://home.t07.itscom.net/kajie/List.htm

After making a full size and flying it, I found that it has superior flight performance and maneuverability compared to 1200mm and rudder planes. However, as I see S-san Auri and N-san's NRJ, I want to make something a little better.

My goal this time is to cut 200g. Specifically, I'm thinking of shortening the fuselage and using lighter servos, even if it means sacrificing tail volume. The main wing is a two-piece connecting piece. I'm trying to make the wings as thin as possible.

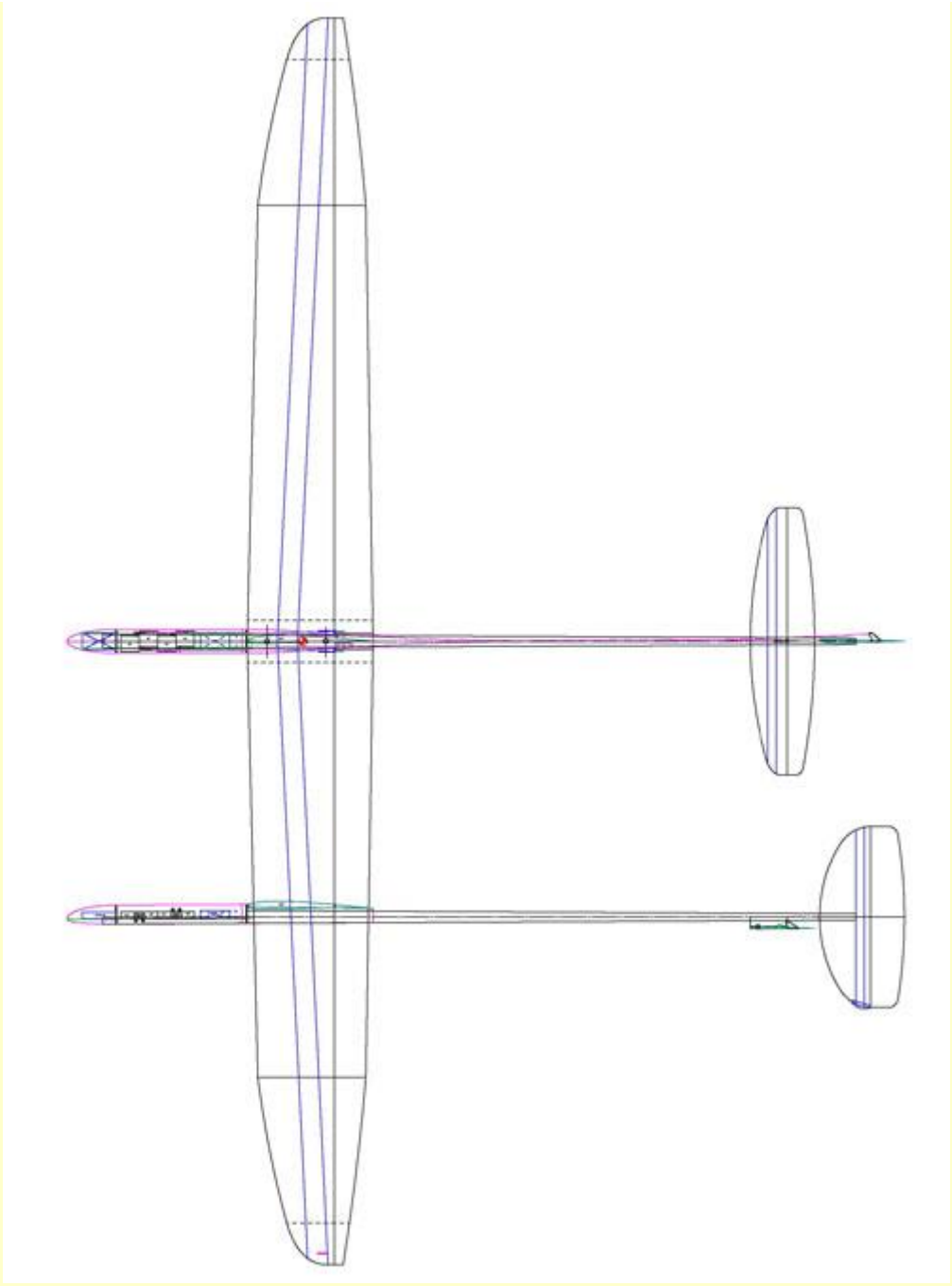
The main specifications are as follows, but will it work well? (20/01/26)

Main wing: Wingspan 1500mm, aileron system, wing type AG12, 13, 14, wing area $^{19.0dm2}$

Tail: Horizontal tail airfoil HT22 modified, vertical tail airfoil modified HT22

Overall length: 1000mm, Overall width: 1490mm

Fuselage: Clair competition boom, Servo: D47 x 4



First flight at last. Lunch without noticing that the ailerons are set in reverse. I was in danger of breaking it. Since it seems to be thrusting, I put a piece of paper about 2 business cards in front of the horizontal stabilizer and fly it. Relatively straightforward flight. Despite the fact that it was early in the morning, there was a thermal, and with the bonus of the first flight first thermal. (20/05/24)

The wingtips are painted in fluorescent green. About 3g increased by painting

Leave the white surfacer on the underside, and attach a balance weight to the tip of the right wing.

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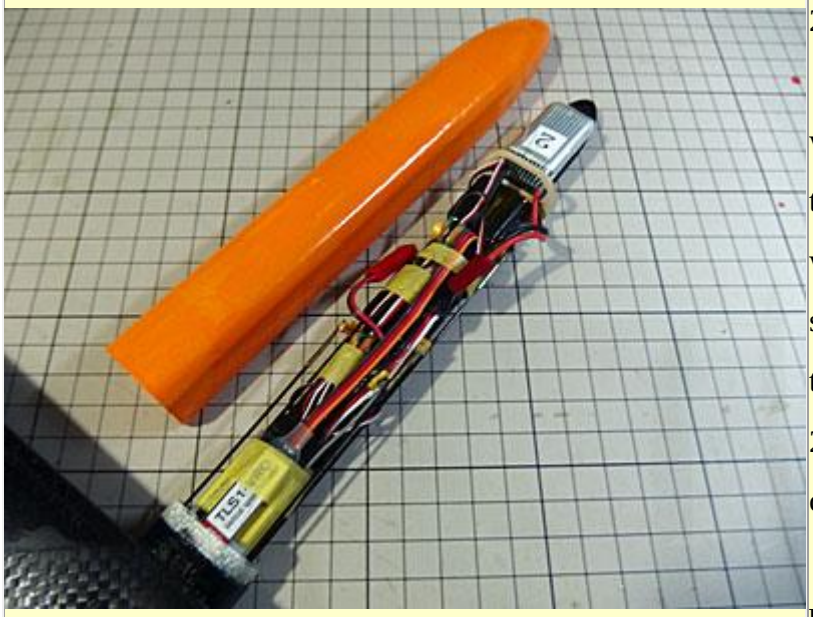
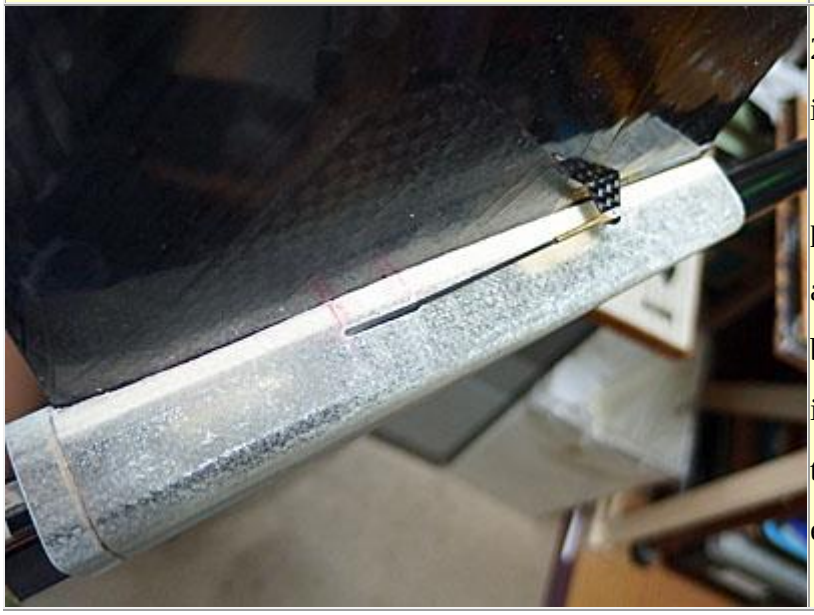
|  | 20/05/16: Completed for now<br>Finished weight 191.1g. A weight of 3.2 g that balances the left and right of the main wing. A weight of 8.4g for setting the center of gravity to the set value makes a total of 202.7g. It did not come true to cut the target of 200g.<br>It's ready for a glide test, but there's nowhere to fly. |
|  | 20/05/10: Rear pod temporary installation<br>I attached the tail, so I can't put it in later. The aileron rods are in the way from the front, but the exit of the aileron rod is cut vertically and passed through. It will be glued in the end, so this is ok. |

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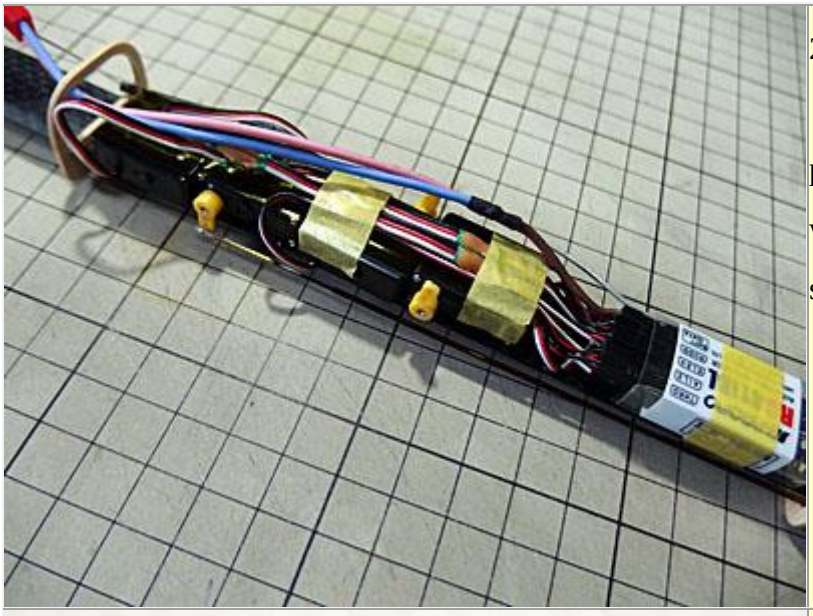
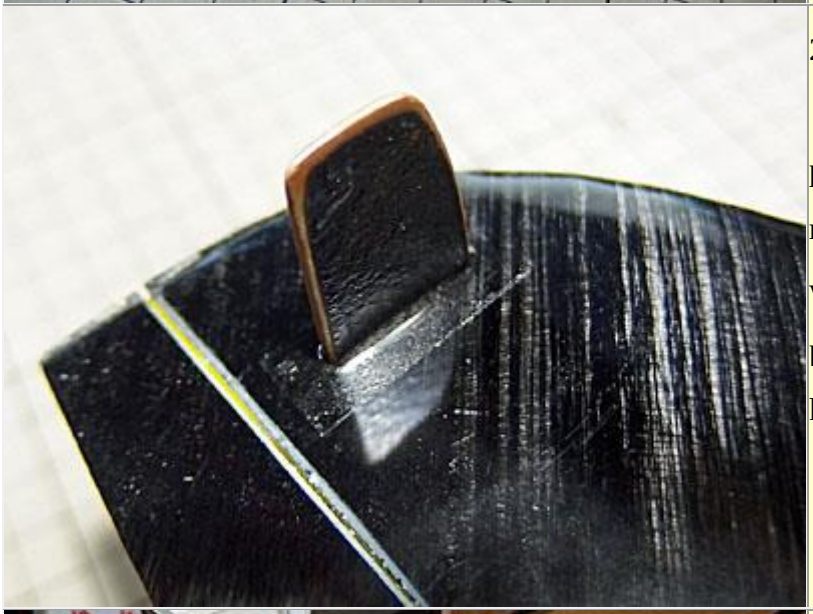
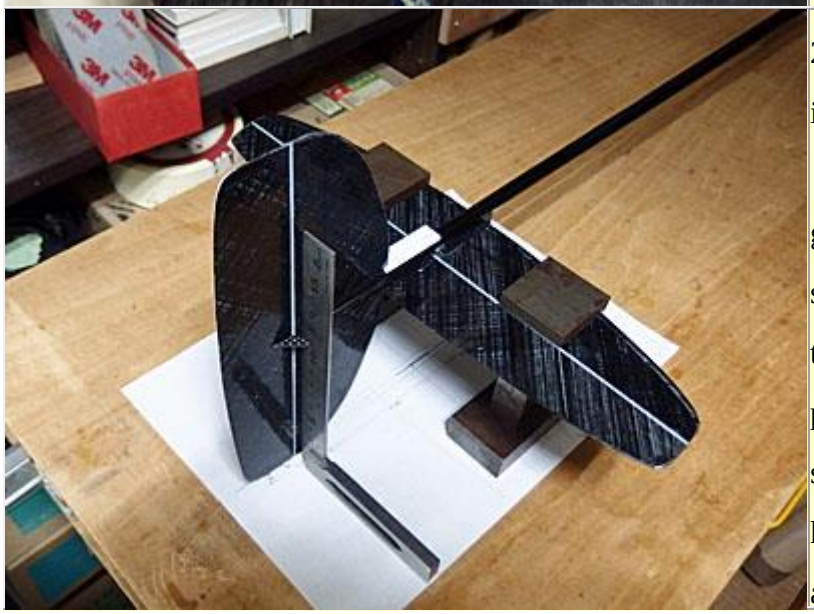
|  | 20/05/09: Servo installation<br>Wrap the servo with polyimide tape and glue it with SU. D47 has a hard cord, so fix it with masking tape. |
|  | 20/05/07: Installing the pegs<br>Drill a hole, insert the previously made peg into the rectangular area, and bond with epoxy mixed with carbon powder for 30 minutes. I don't know if I will have this. |
|  | 20/05/05: Vertical stabilizer installation<br>The vertical stabilizer is glued with metal lock points so that it is perpendicular to the horizontal stabilizer. I was planning to add more if it stopped moving. Although the kneaded product solidifies in about 5 minutes, the dotted |

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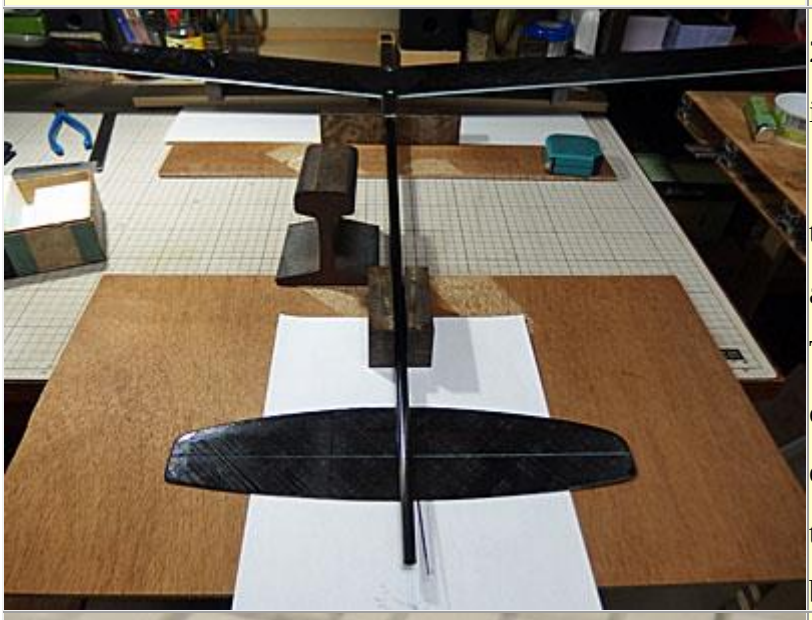
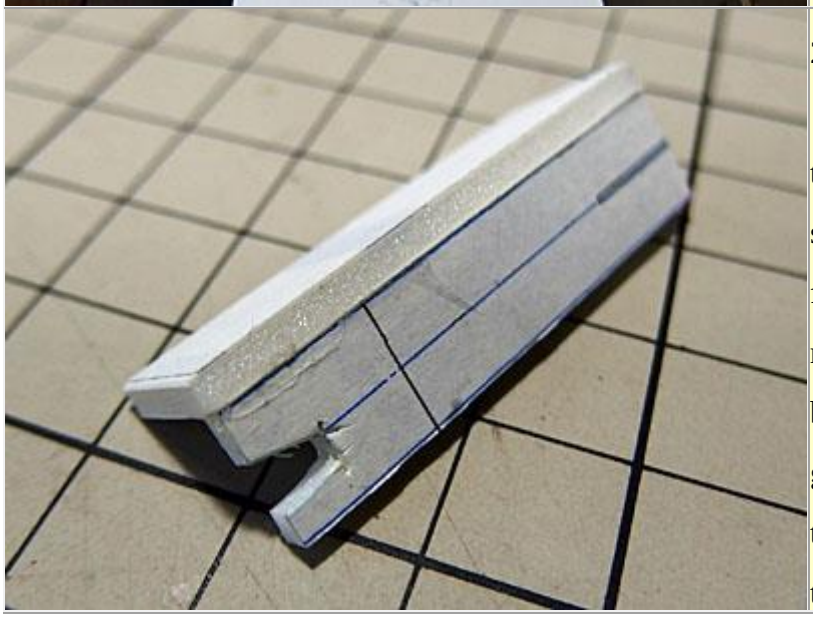
| | part does not solidify even after 30 minutes. I have no choice but to run CA. I don't know why the dots don't stick. |
|  | 20/05/05: Horizontal stabilizer installation<br>Glued so that it is parallel to the main wing. The adhesive is metal lock.<br>The linkage uses a 0.8mm carbon rod and a 1mm inner diameter polyimide tube. This time, it was placed inside the boom. |
|  | 20/05/04: Vertical stabilizer<br>The vertical tail is slightly tilted from the reference line, so a jig is essential. This is for fixing the front edge. The material is 2mm styrene board. On the rear side, I'm going to do something so that the tail wing is in the center of the boom. |

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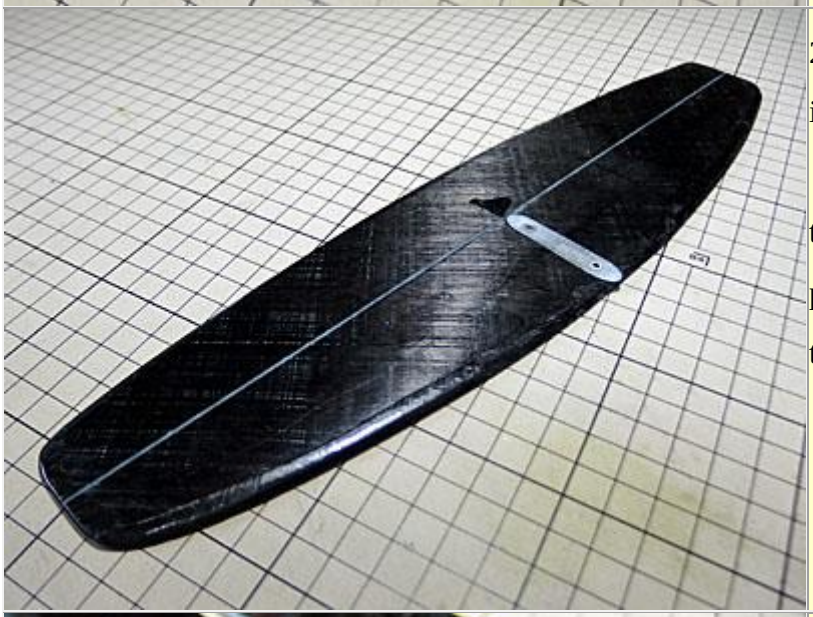
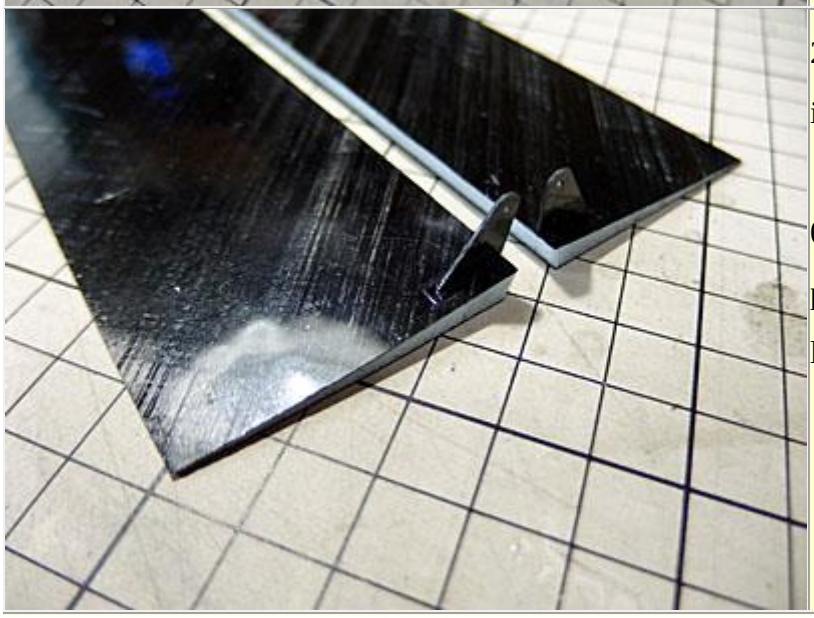
|  | 20/05/04: Rudder horn and tail skid installation<br>Works like an elevator. |
|  | 20/05/04: Elevator horn installation<br>The method is the same as the aileron. A 15mm wide polyimide tape was used for the hinge. |
|  | 20/05/04: Aileron horn installation<br>The horn is cut from a 0.5mm thick carbon fiber plate. The adhesive uses metal lock. |

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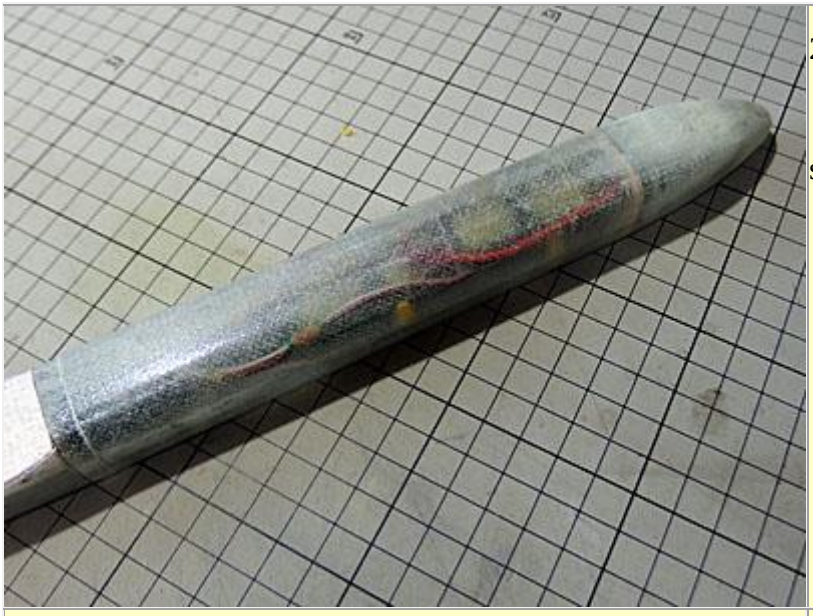
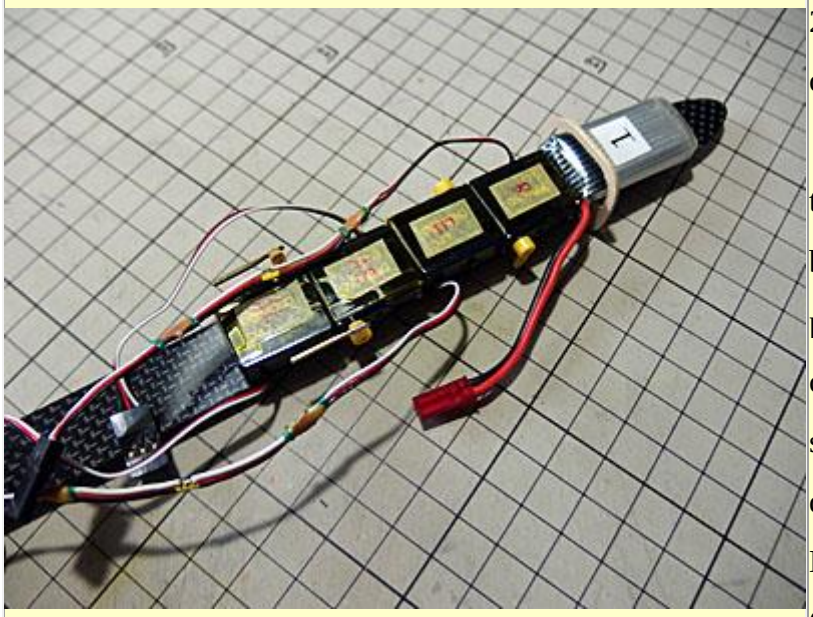
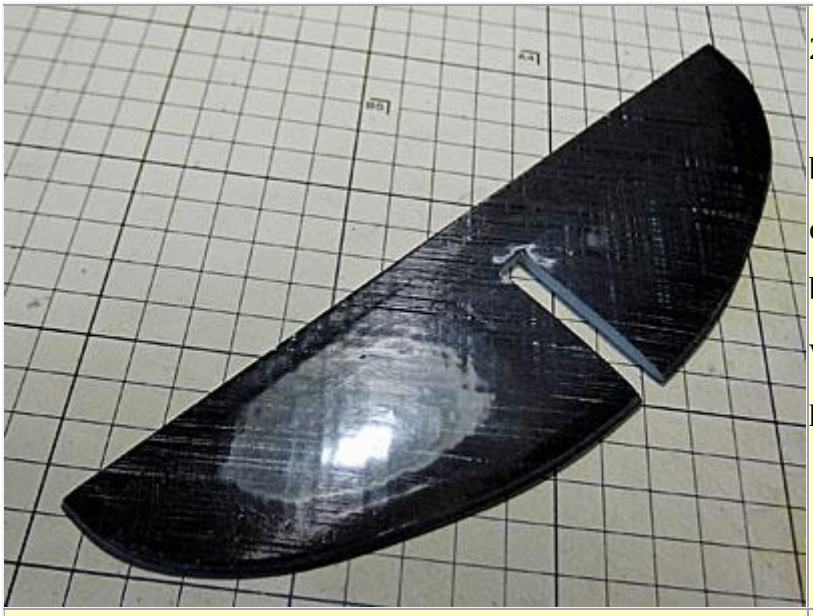
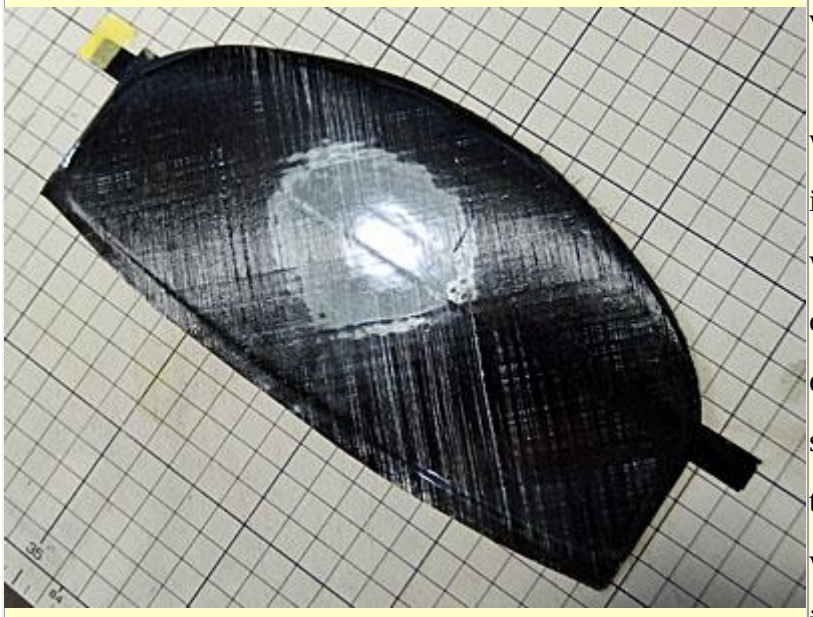
|  | 20/05/03: Pod Cover<br>It didn't go smoothly, but somehow it fit. |
|  | 20/05/03: Temporary loading of servos<br>I'm worried about whether the cover will fit smoothly because I narrowed down the pod considerably. Temporarily stick the servo etc. with double-sided tape. Servo is D47 taken down from Cheeper carbon light. |



20/05/02: Mounting cutout

I cut it with a milling cutter, but this time I did it too carefully and it didn't fit in the boom. After all, I adjusted it with a board with sandpaper pasted on it.



20/04/30: Rework of the vertical stabilizer

When I was looking at it while thinking about installing it on the boom, I couldn't tell which was the front. Upon closer inspection, I found an error. For some reason, when shaping the form, it seems that the front and back were wrong. I reluctantly remade it. I think I'm starting to fall in love...

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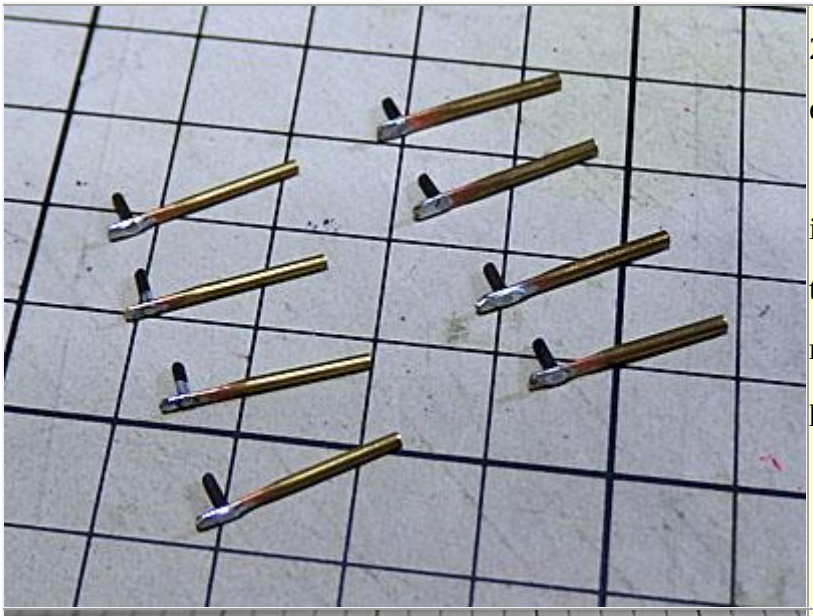
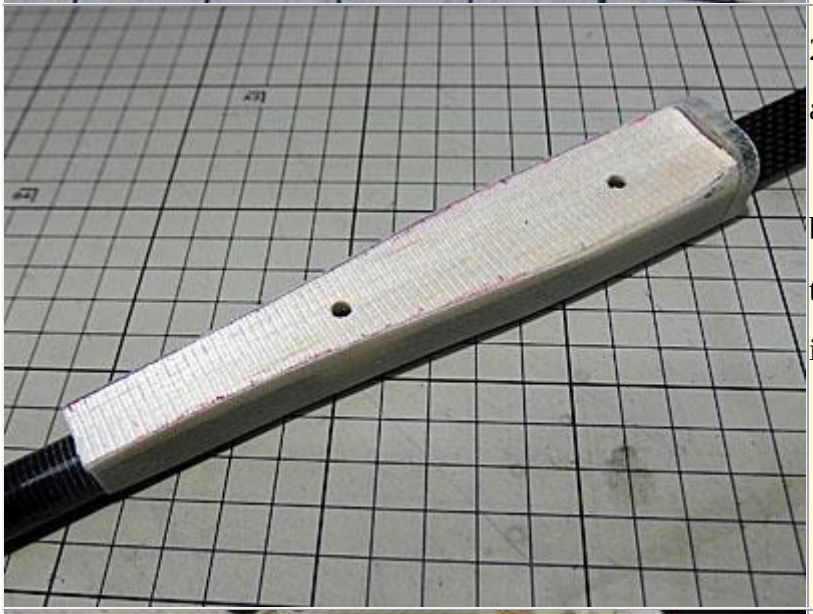
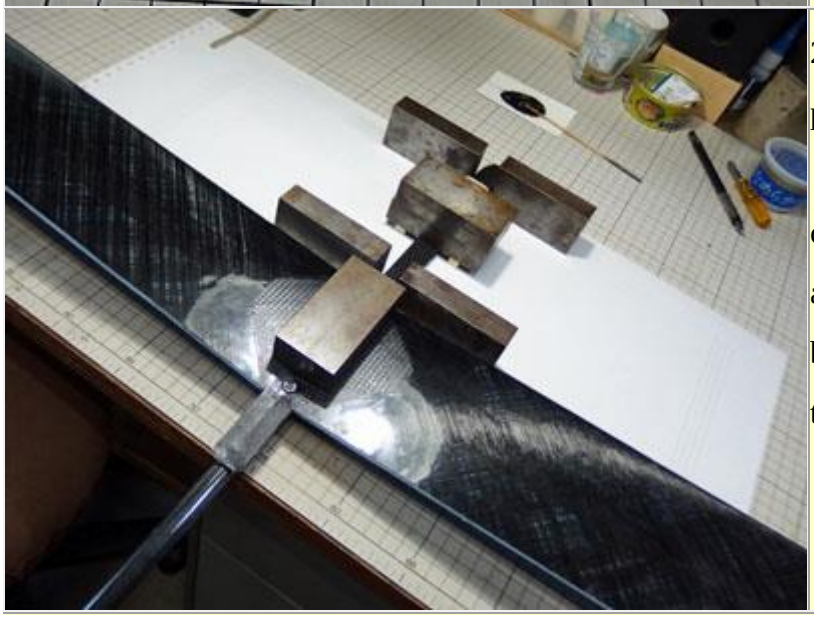
|  | 20/04/23: Fabrication of rod ends<br>I used a brass pipe with an inner diameter of 0.8mm for the tail and 1.0mm for the main wing. The pin is φ1.0 piano wire. |
|  | 20/04/23: Pod rear temporary alignment<br>Glue the wing bed to the boom and cut off the top of the rear pod to temporarily fit it. |
|  | 20/04/19: Glue the main wing pylon foundation to the boom<br>This time I worked carefully so as not to tilt. The adhesive is metal lock. I'm busy because I have to glue two places at the same time. |

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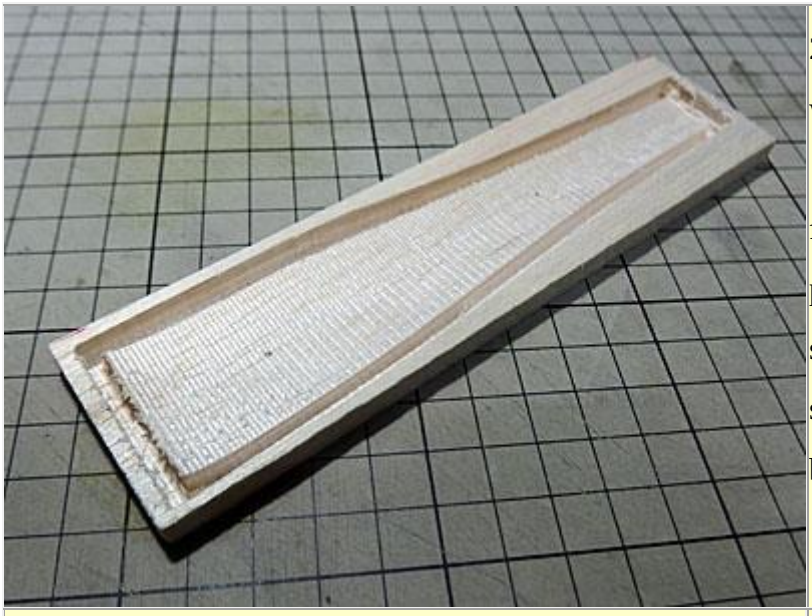
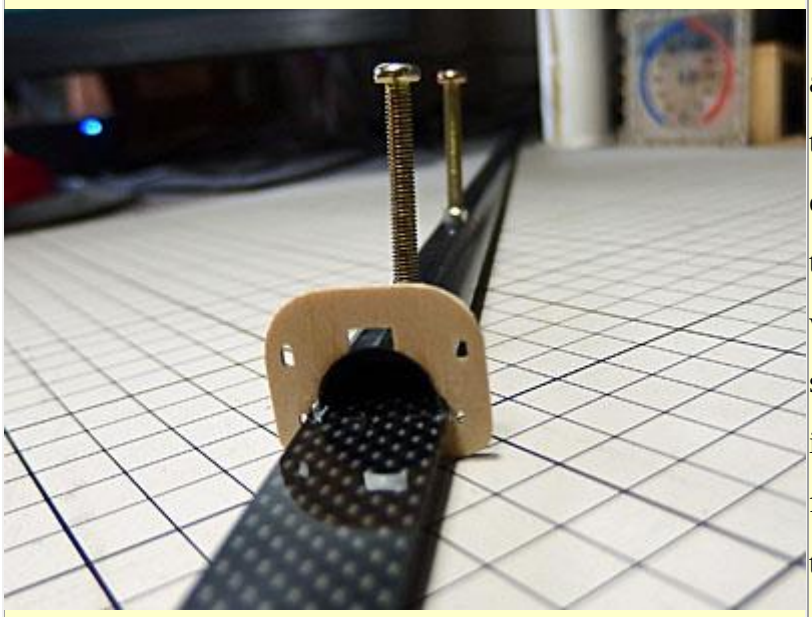
|  | 20/04/18: Rebuild the main wing bed<br>The one I made before was fine, but I cut it so that the position of the pylon can be seen. I used 8mm balsa, so I shaved about 1.8mm from the back side. |
|  | 20/04/18: Wing pylon foundation<br>I ended up removing the leaning pylon foundation and rebuilding it anew. I glued an M4 nut to the leftover boom piece and installed it by drilling a hole in the boom. The adhesive is metal lock. I hope you have it. Difficult to use due to short pot life. |



20/04/11: Contact between boom and wing

When the main wing is attached to the boom, it is tilted from the reference line of the fuselage frame. It seems that it tilted when the boom was cut to create a servo space. There is also a way to ignore it and proceed, but it feels a little uncomfortable. If the main wing and tail are properly installed, I don't think it will affect the performance.

20/04/12: Pod completed

Adjust so that the pod fits while sanding the front torso frame little by little. The rear part needs to be cut off from the top half.

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|  | 20/04/11: Take out pod-shaped blue foam<br>Dissolve in acetone. The body frame I was worried about was easily removed. The wrap was also wrapped diagonally, so it came off without difficulty. Scrape off the blue foam on the wall with a bandage that sticks to the chopsticks. |
|  | 20/04/11: Podbagging results<br>Finished relatively clean with no wrinkles. Streaks can be seen in areas where the wrap overlaps. |

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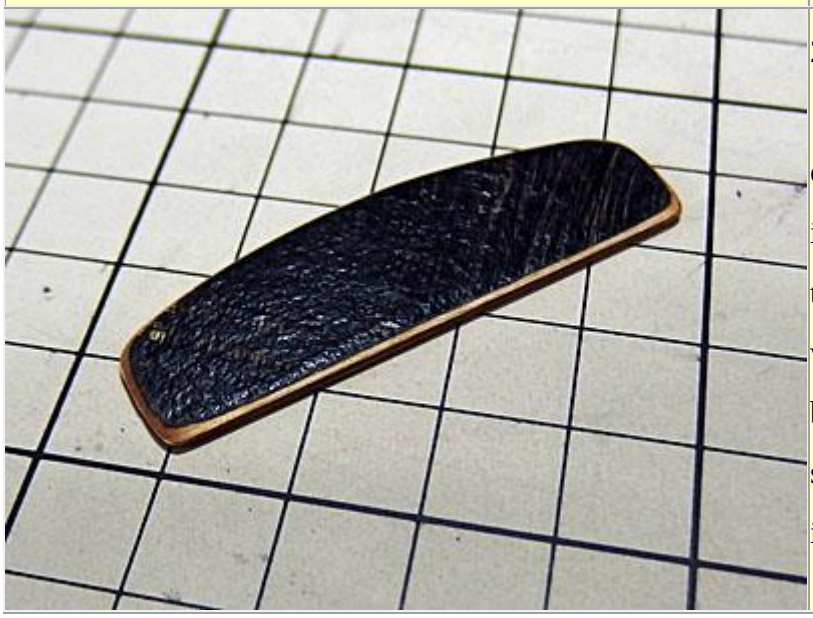
|  | 20/04/10: Pod glass finish paste<br>200g/m2 bagging is sanded to reduce unevenness, and 60g/m2 glass is pasted on top of the glass. The procedure is almost the same as for 200g/m2.<br>Apply 5052 on top of the glass, cover with packing wrap and bag. |
|  | 20/04/10: finished peg<br>Carboline sandwiched the core of the veneer and bagged it. After sanding, the carbon in the cross-sectional direction was scraped. There seems to be no problem in terms of strength, so I plan to use it as it is. Weight is 1.2g |

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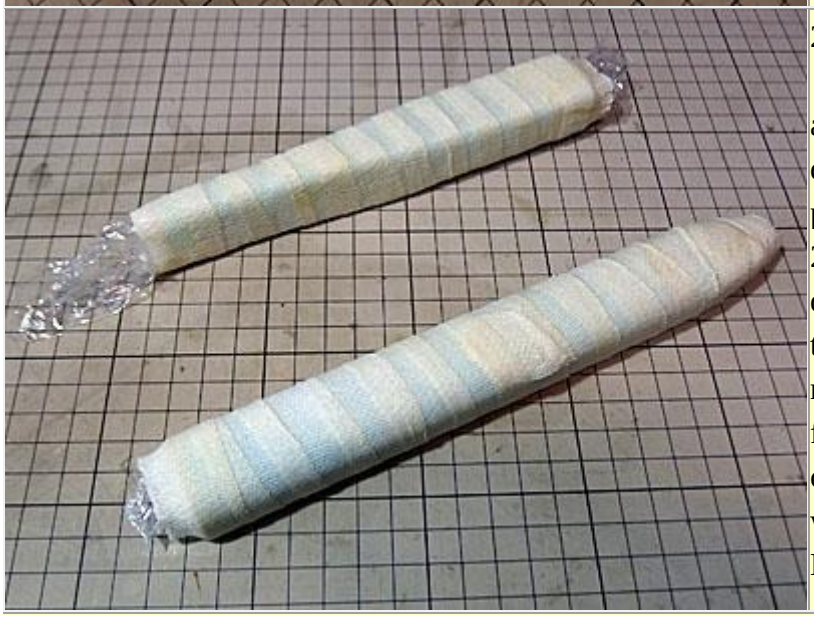
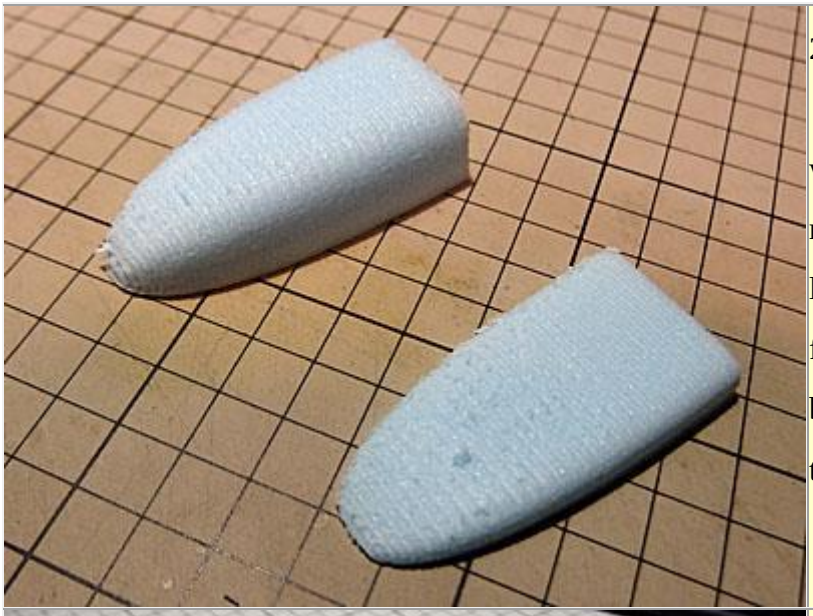
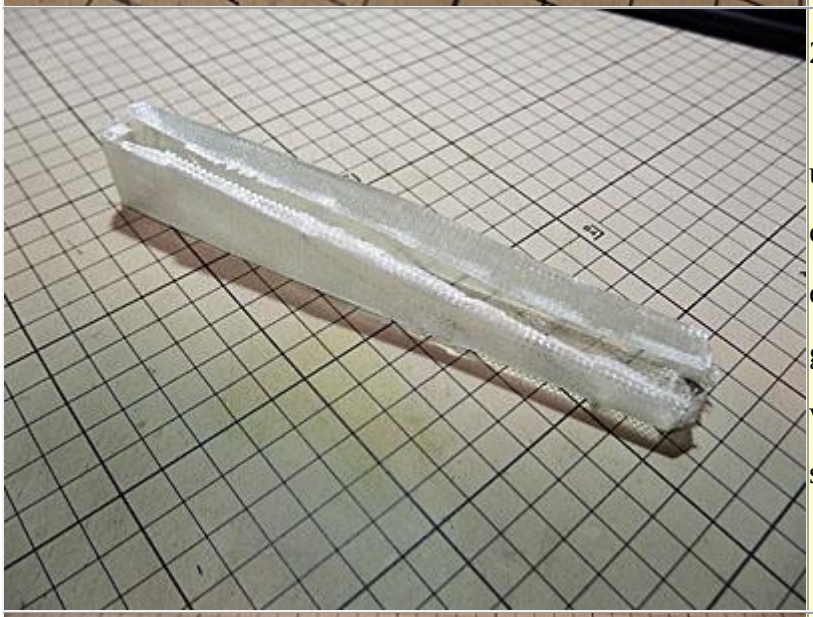
|  | 20/04/08: Production of pegs<br>Uses 1.7mm aeronautical veneers. The left is 45 mm long and the right is 50 mm. At first, I made it with 45mm, but I felt it was too short, so I remade it. I plan to put carbon on it. |
|  | 20/04/08: Pod bagging results<br>The glass now adheres to the mold. But there are traces of bandages. I may have wound it a little too tight. |
|  | 20/04/07: Pod rework<br>The failed mold is used again after fixing the dents. Wrap a piece of packaging wrap cut into about 2 cm around the mold diagonally. Blow 3M55 onto the glass and stick it on the mold. Apply 5052 to the glass from above with a roller, cover with packing wrap, wrap a bandage that sticks to Nichiban and bag it. |



20/04/04: Pod tip

I cut out only the tip part with a milling cutter to recreate the mold that I didn't like anyway. It looks good at first glance, but the size of the bottom is different between the top and bottom.



20/04/01: Pod sanding results

I thought it would be useless, but as expected, it is completely useless. I think the cause is that the wrap and the glass are not in close contact with the mold. Now what shall we do?

20/03/30: Podbagging results

Large wrinkles...

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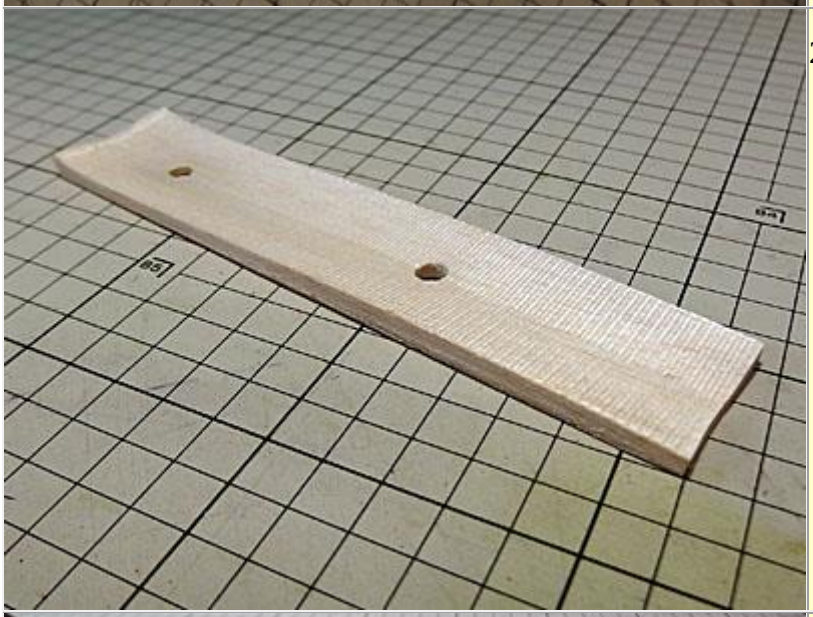
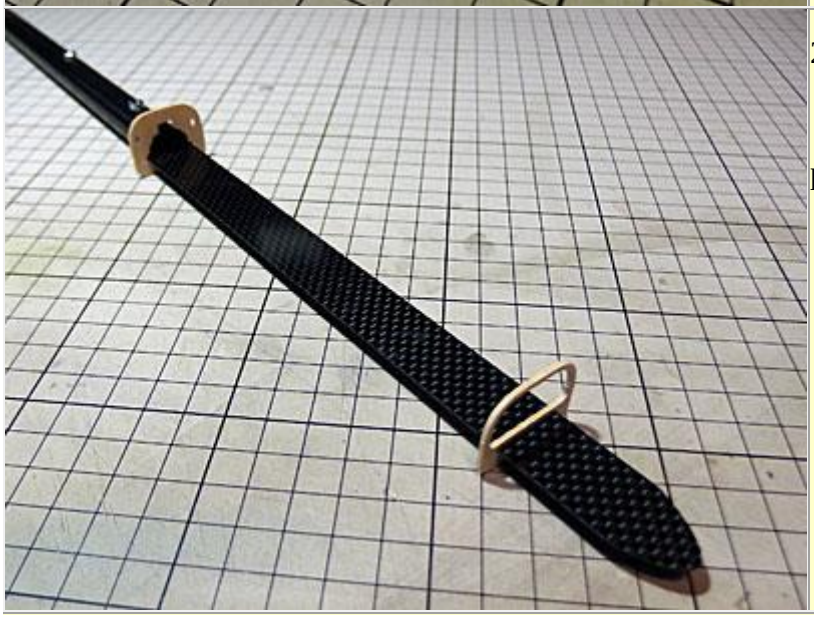
|  | 20/03/30: Podglass molding<br>A thin plastic wrap is attached to the mold and a glass of 200g/m2 is attached on top of it. Apply 5052 with a roller and bag it. |
|  | 20/03/29: Wing bed<br>Milled from balsa wood. |
|  | 20/03/29: Pod frame<br>Cut out from 1.2mm plywood with a milling cutter. |

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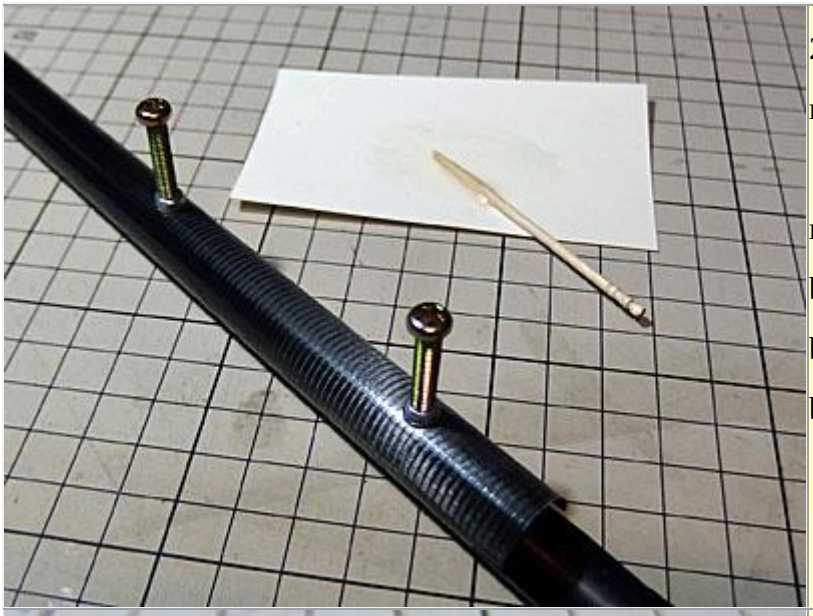
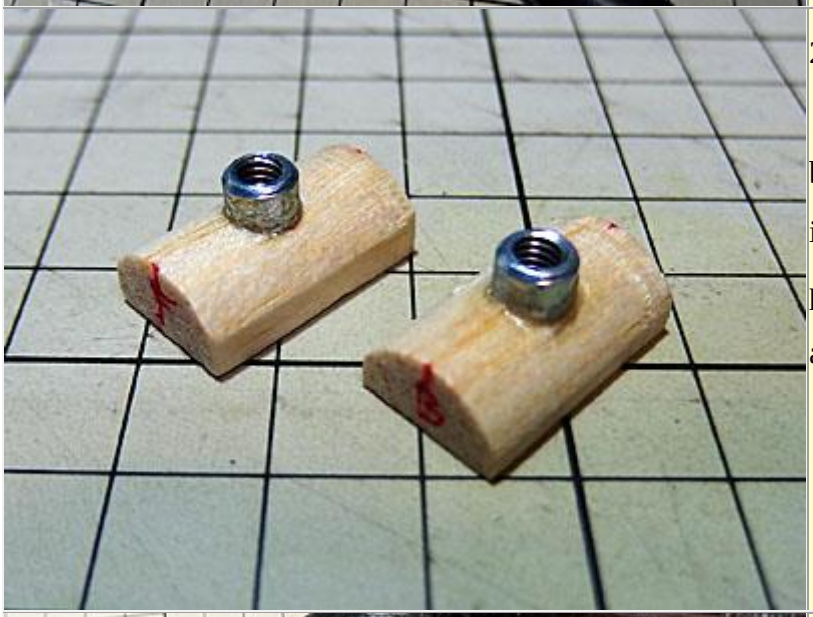
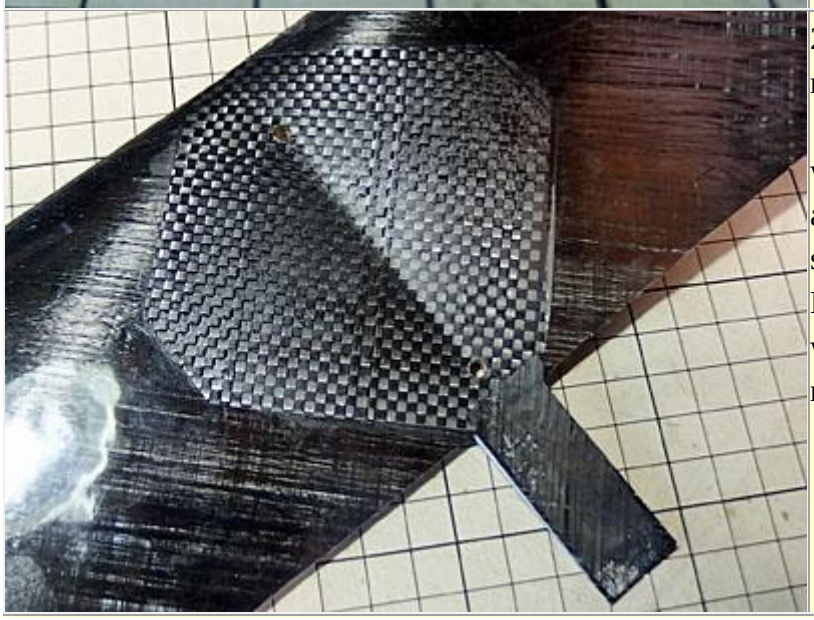
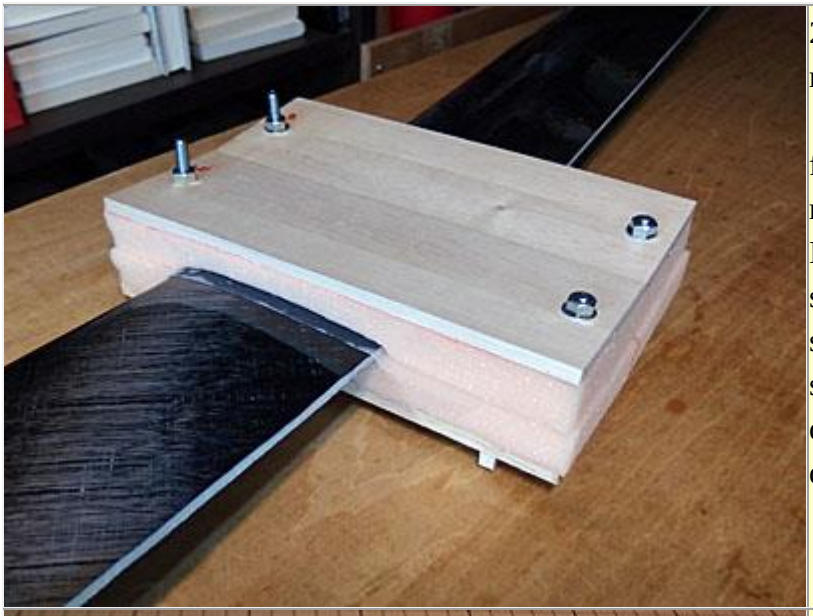
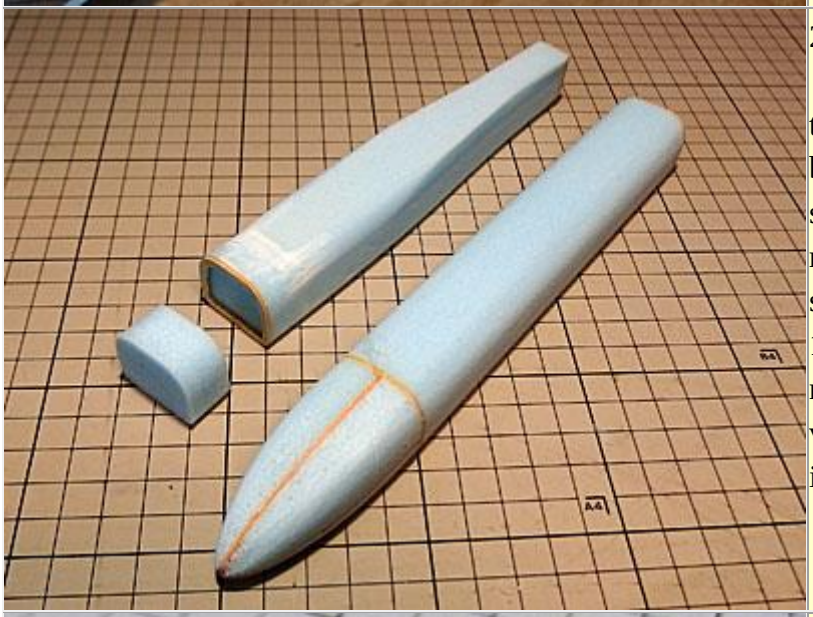
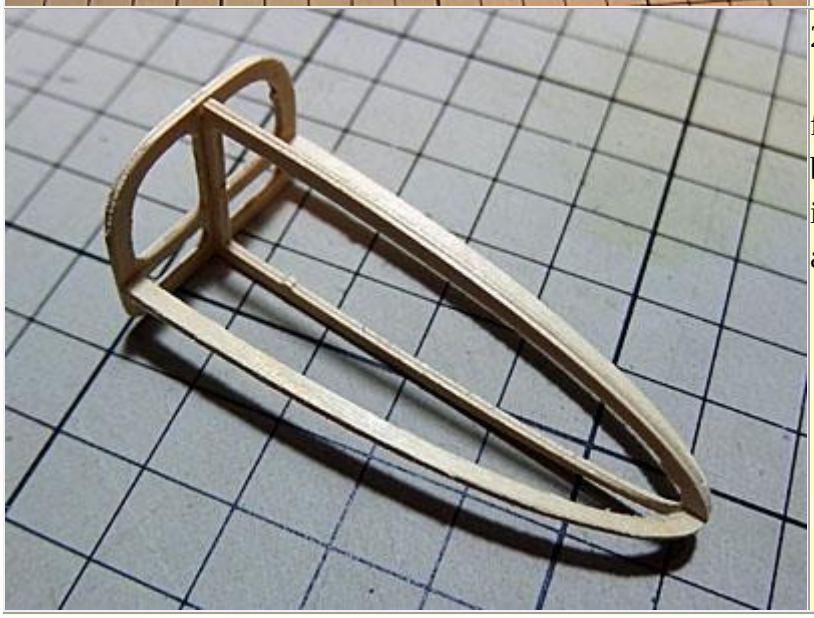
|  | 20/03/26: Adhesion of wing retainer pylons<br>Glue with epoxy for 30 minutes. Apply glue to the balsa, pass it through the boom and tighten the long M4 bolt to crimp it. |
|  | 20/03/25: Wing pylon<br>Use the M4 onime nut. The base is balsa wood. Selection is difficult. Cut off the wings protruding from the balsa with a scroll saw. |
|  | 20/03/22: Reinforcement result of main wing joint<br>Using spread carbon-61 with bias. Between the carbon and the sponge, I used a thin silicon sheet sold at Hyakuyen. This works well with curved surfaces and does not adhere to epoxy. |



20/03/20: Reinforcement of main wing joint
I have never had a clean finish with the joint of the reinforcement part. This time, I tried a method of forcibly sandwiching it with a 20mm sponge to make it stick. Epoxy is 5052. The dihedral angle was 6 degrees. I hope it goes well...



20/03/20: Pod type
I thought about changing the tip part, but I stuck the blue foam as it was and sanded it. As expected, the rear part was not long enough, so I extended it by about 15mm. Ultimately, it is necessary to remove the veneer frame, but I wonder if it will come off well.



20/03/15: Pod Formwork
Mill out from 1.2mm flexible veneer. I plan to paste blue foam on this and sand it. I should have made the tip a little thicker.

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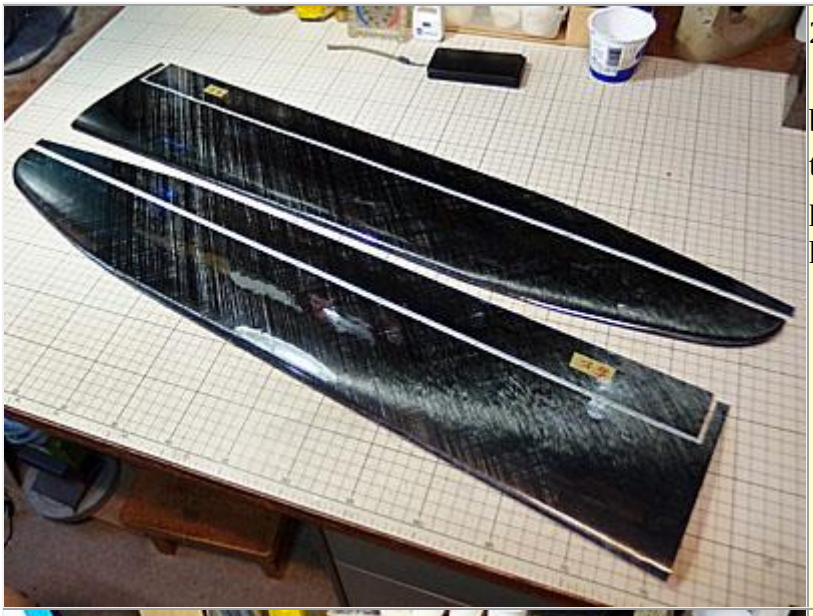
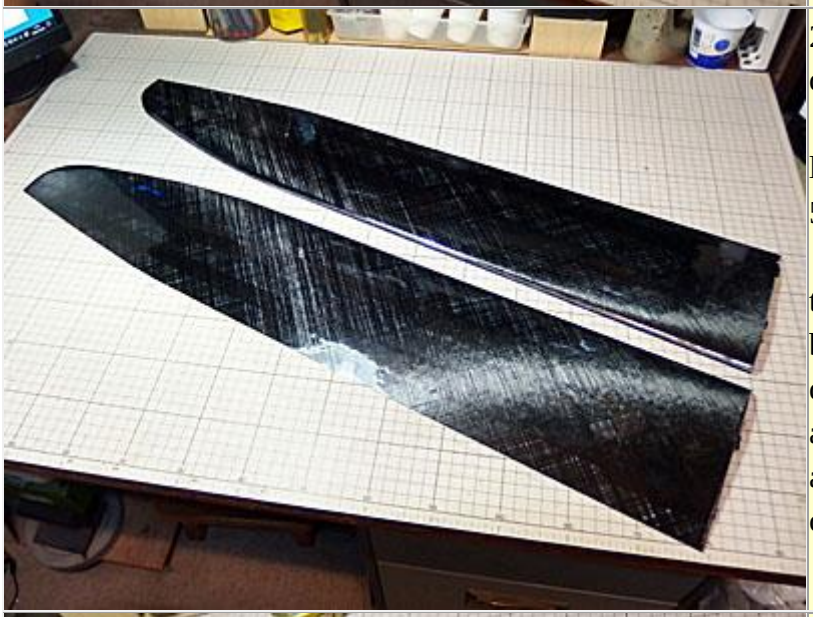
|  | 20/03/12: Aileron detachment<br>I cut it with Olfa's black blade, but it inevitably twists. I'm planning to use polyimide tape because I don't have hinges. |
|  | 20/03/08: Main wing after deburring<br>Right wing weight 43.70g, left wing 49.00g, difference 5.30g.<br>I played poka again. Forgot the epoxy blotter when bagging his left wing. That's a difference of 5.3g. There is also a peg on the left wing, and the weight balance is out of order... |
|  | 20/03/06: right wing bagging<br>UD tape with a thickness of 0.07mm and a width of 24mm is used for the spar. Bagging with reinforced layers on the wing root and ailerons.<br>The bagging this time went well with almost no burrs.<br>With the 1500-1, I used 20mm UD tape and felt that it lacked rigidity, but there is no sign of that this time. |

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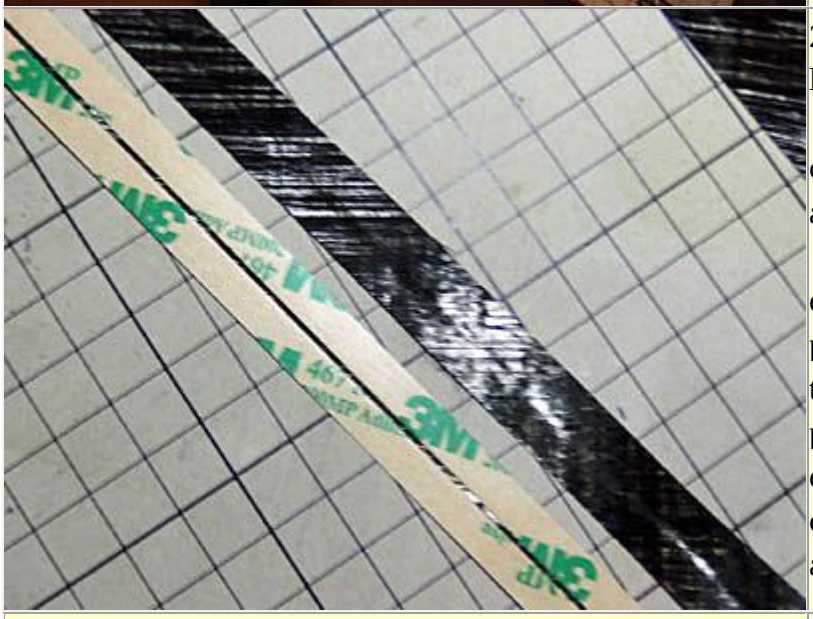
|  | 20/03/04: Carbon attached to the leading edge of the main wing Shorter carbon attached with 3M467 is easier to work with than longer one.<br>HobbyLite filled the dents in the main wing joints. |
|  | 20/03/03: Put carbon on the leading edge of the main wing<br>I attached 3M467 to the carbon line, cut it out, and attached it to the main wing.<br>So, I opened the center part of the 3M467 slightly and pasted it on the carbon, and then pasted the one with the protective paper removed on one side. With this method, it can be pasted neatly with almost no extension. |
|  | 20/02/24: Dent in main wing joint<br>The part that was glued with 3M wasabi glue came off during sanding, so I sprayed the foam safe moment and sprayed the hardening accelerator, but it was dented as shown in the picture. It's not going well with my friends.<br>After joining, remove fine whiskers that occur when cutting with 3M sponge |

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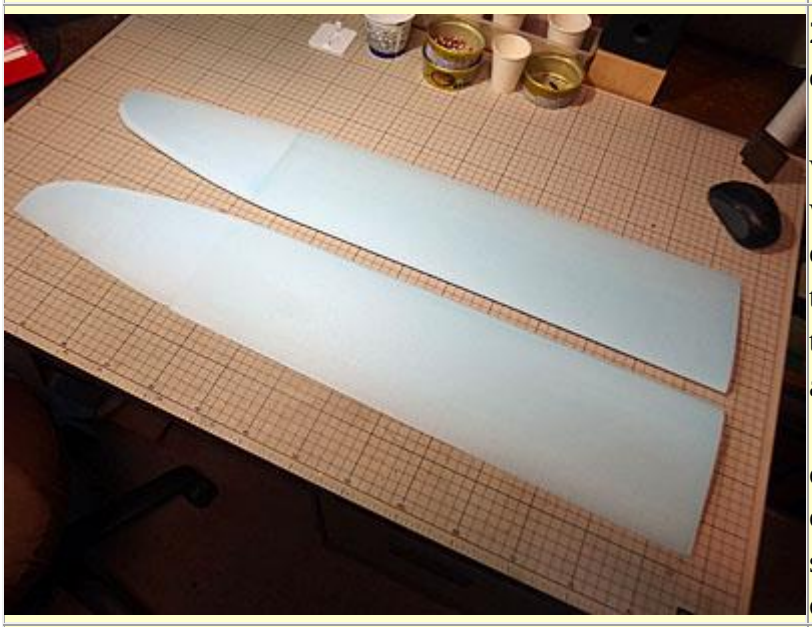
| | sandpaper, then wash with water and dry. |
|  | 20/02/24: Finished main wing core<br>Glue the inner and outer wings together with 3M wasabi glue and adjust the outer shape. After that, draw the leading edge line and sand the leading edge using this as a guide.<br>The leading edge of the outer wing was largely cut in order to adjust the plane shape, so the airfoil was considerably deformed. |
|  | 20/02/23: Main wing inner wing hot wire cut<br>Semi-automatic cutting. Check the position of the roller and the rail of the flexible wheel attached to the rear of the bow so that the trajectory of the heat wire moves as planned. This time it worked without failure.<br>However, the trailing edge side shrinks slightly probably because of the heat. This can only be adjusted by sanding. |

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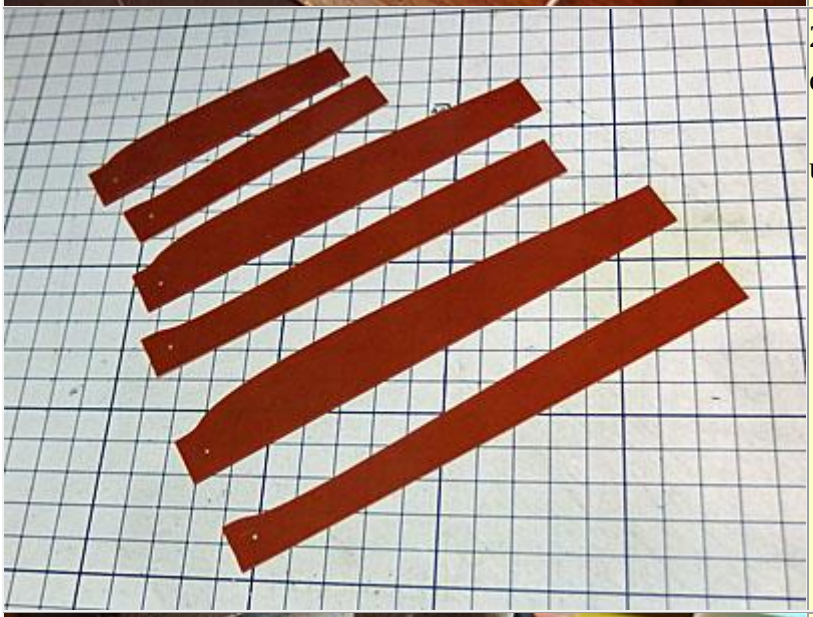
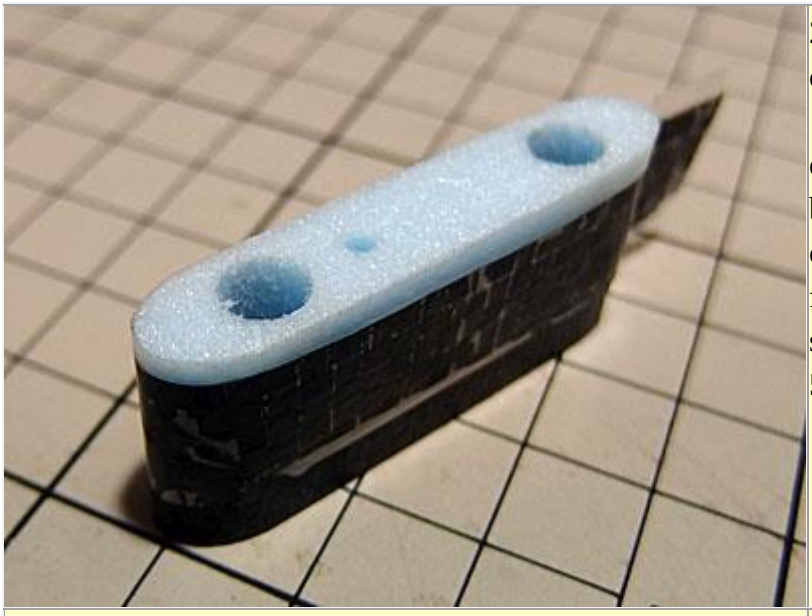
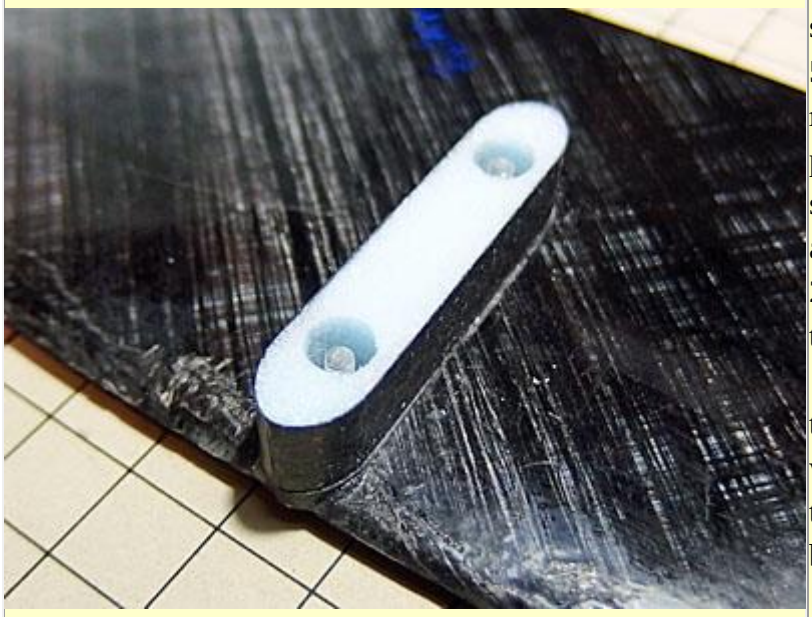
|  | 20/02/22: Outer wing hot wire cut<br>Fix the bow on the wingtip side and cut it into a fan shape. Manual cutting. |
|  | 20/02/16: Main wing template cut<br>1.0mm bakelite plate is used. |
|  | 20/02/16: Horizontal stabilizer cut modified<br>This time, I set it so as not to make a mistake and cut it. |



20/02/11: Horizontal tail change

I thought about making it out of plywood, but it would be too heavy, so I decided to carve it out of blue foam. The foam was wrapped with spread carbon and glued with 5052. Ignore the vacuum.

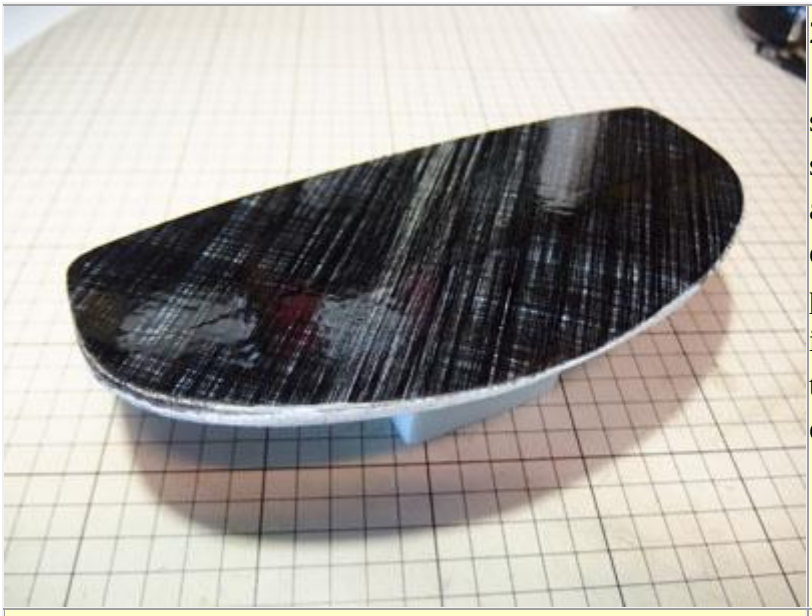


20/02/09: Horizontal stabilizer stage

Wrap the blue foam with spread carbon and glue it with 5052. The wings can be removed with φ2.6mm polycarbonate screws. However, I accidentally cut the base by 2.5 mm too much. I'm thinking about what to do...

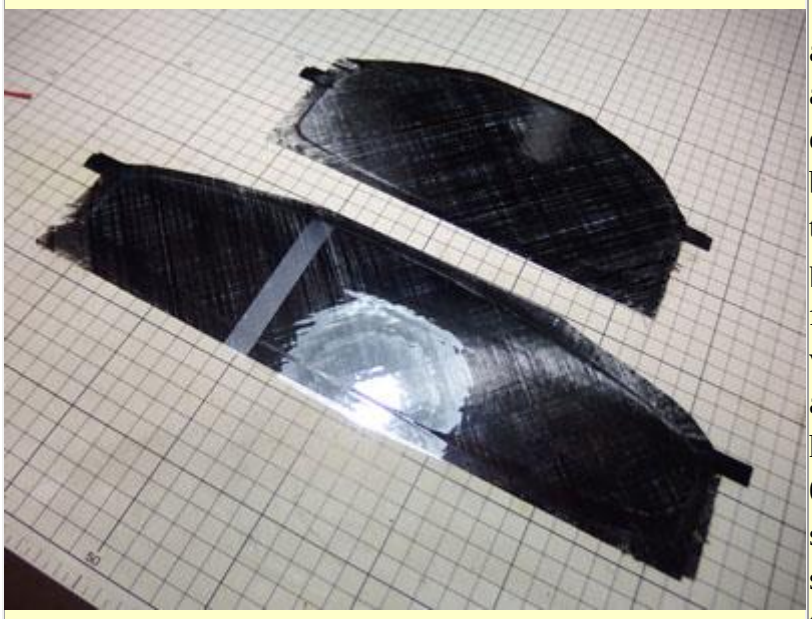
Carbon was re-applied to the front edge, but the finish was not clean. It seems better to stick the carbon from the beginning.

The core is thinner, but it doesn't make it lighter. It was 11.4 g horizontally and vertically.



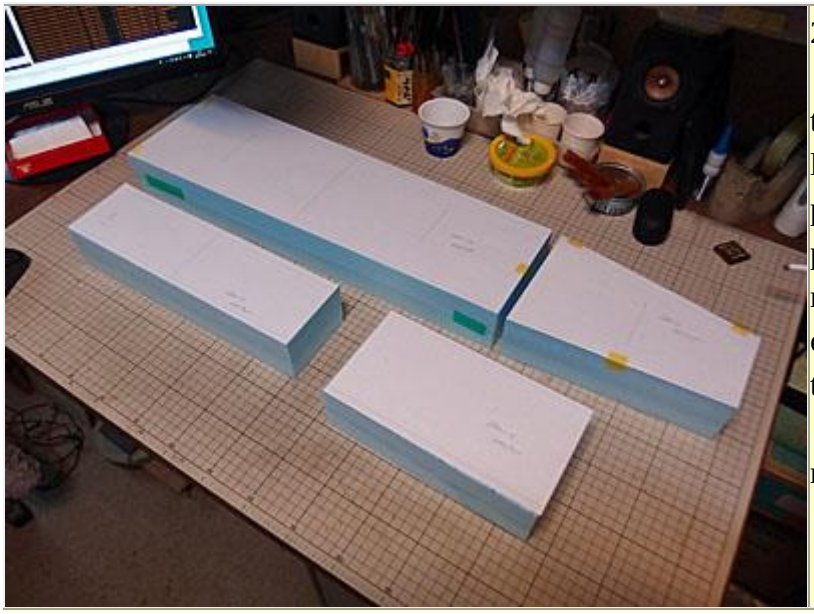
20/02/02: Deburring

Cut off large burrs with scissors and smooth with sandpaper. I shaved too much and the foam inside came out. I don't think there is a problem with the strength, but it's not good as it is, so I'm thinking about putting carbon on top or rebuilding it.



20/02/02: tail bagging

The foam is cut into an airfoil shape with a hot wire, and the plane and leading edge are adjusted and bagged. Carbon uses the same thing as 1500-1. The bagging plate is A4 size lumirror film. The thickness of the vertical stabilizer is 0.05mm, and the thickness of the horizontal stabilizer is 0.75mm. The strip on the left side of the horizontal stabilizer is the mending tape that connects the film. The photo is before deburring.



20/01/26: Form cutout

The material used is 30mm thick Styroace-II. Cut in 2 layers. Two tail wings were prepared. The white one is a paper pattern for cutting. A margin of 5 mm is provided on both the leading edge and trailing edge sides.

I had a hard time remembering how to do it.