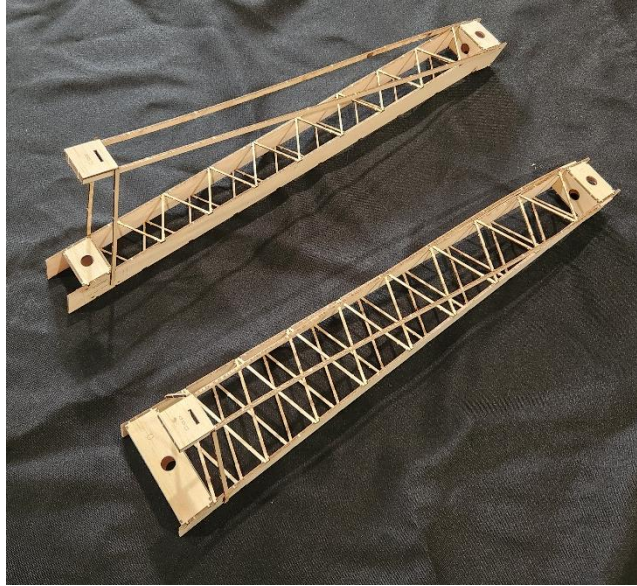


EZ Boomi 2027 B Build Manual

By J&H Aerospace ↗

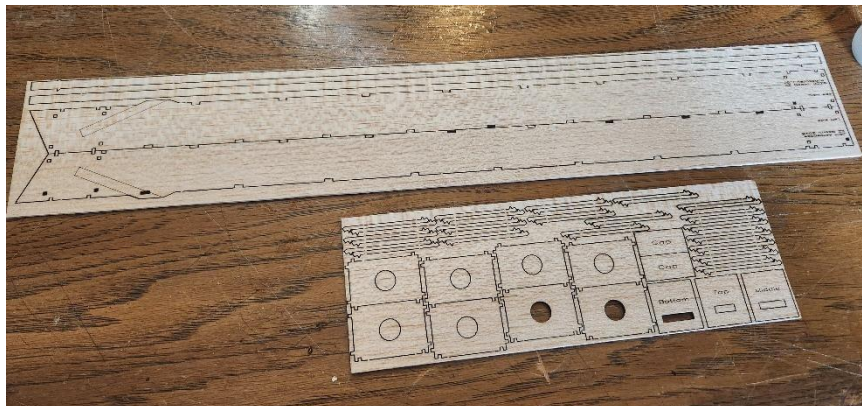
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Self jiggling Boomilever For Science Olympiad Division B



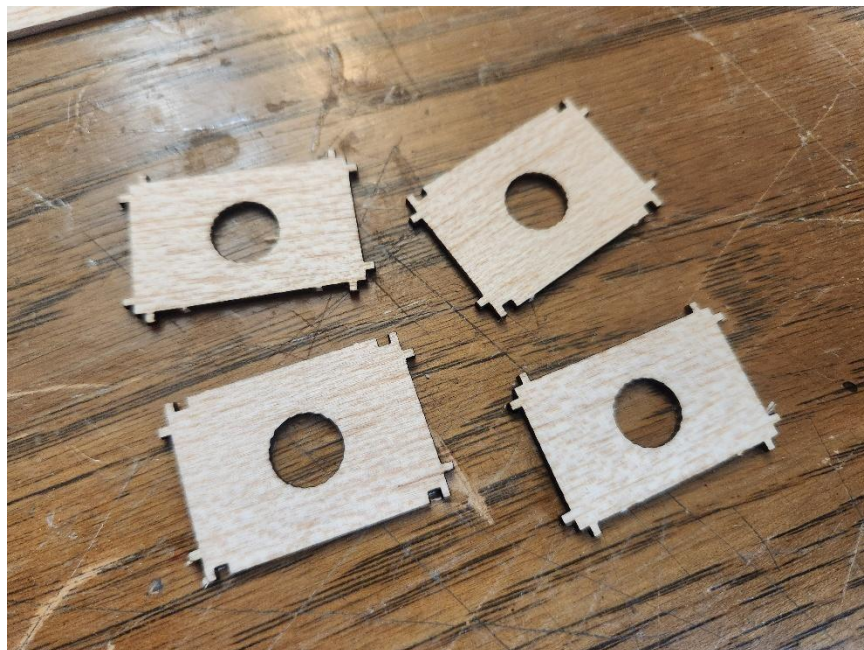
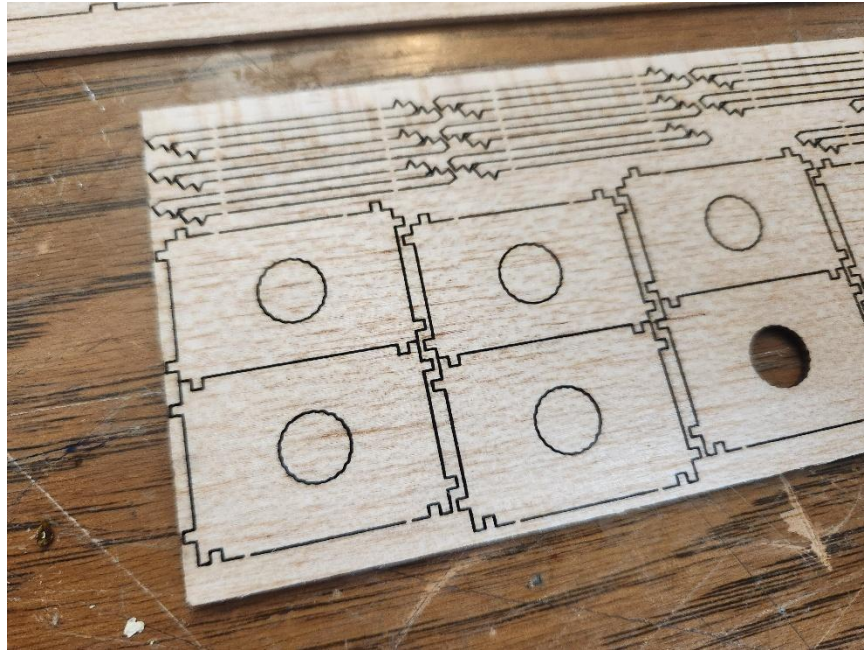
Tools/materials required: CA glue (or Duco/Ambroid/Sigment), razor blades, sandpaper.

Contents: 3 Sheets of 1/16" laser cut balsa parts (B and C cross piece sheets)



Your boomilever is self-jigging, however it does require careful assembly. The following instructions will help you to create an accurate structure. We used CA on our build, however if you use a few weights and gages, you can assemble a lighter device using Duco cement or thinned wood glue.

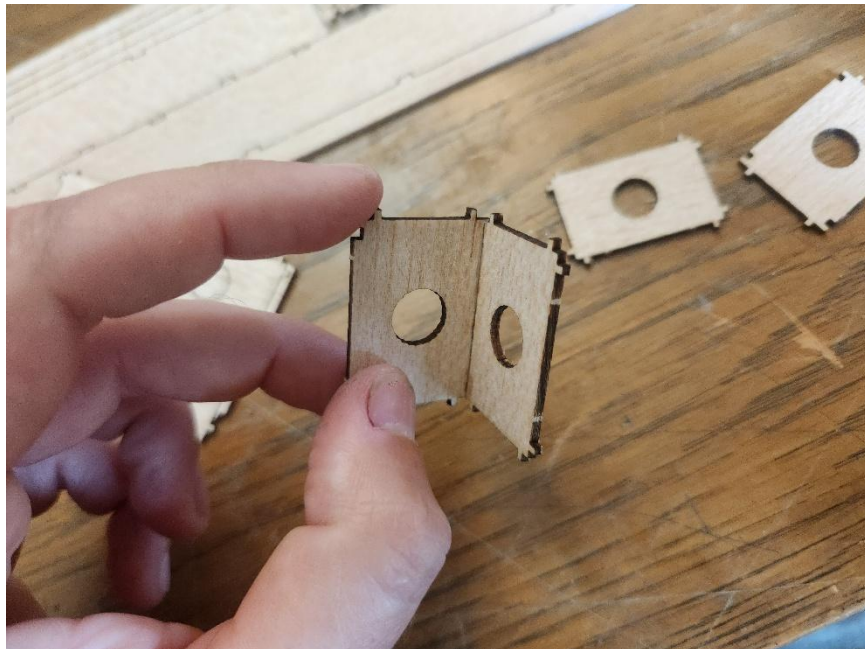
Carefully separate the end box parts from the parts sheet. Note that there are 4 of each type. You will need two of each type to assemble an end box.



Match up a pair of one of each type of box side and test fit them together. Clean out any burrs which prevent a proper fit, and then glue them together perpendicular to each other.



Build up a second pair in the same way.



Now attach these two pairs together to make an open ended box.



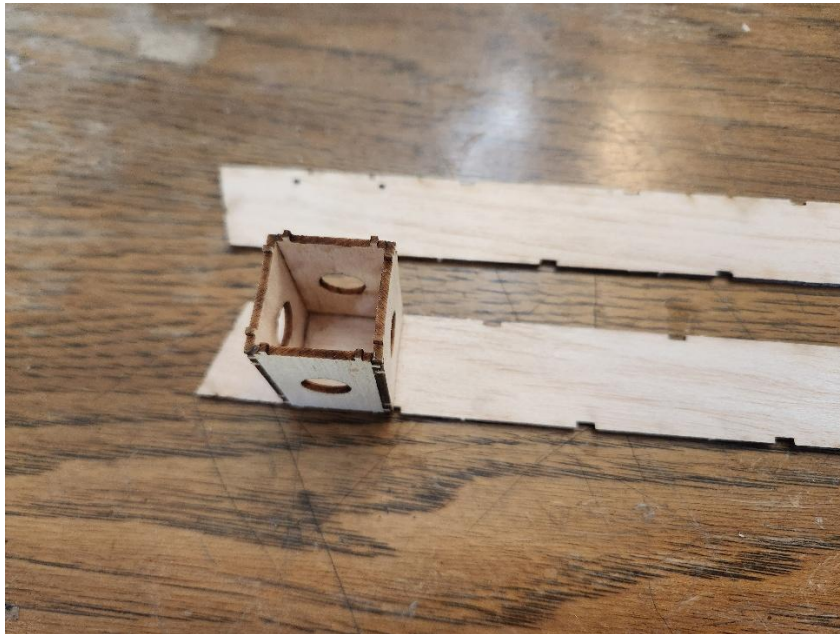
Assemble a second box using the above steps.

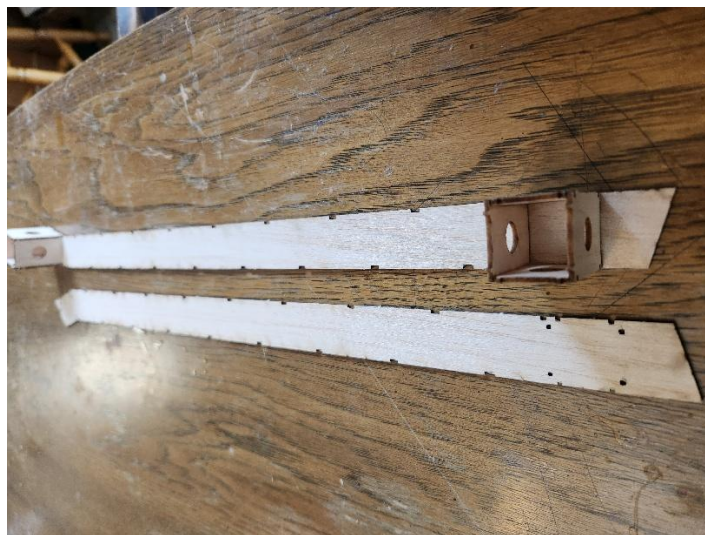
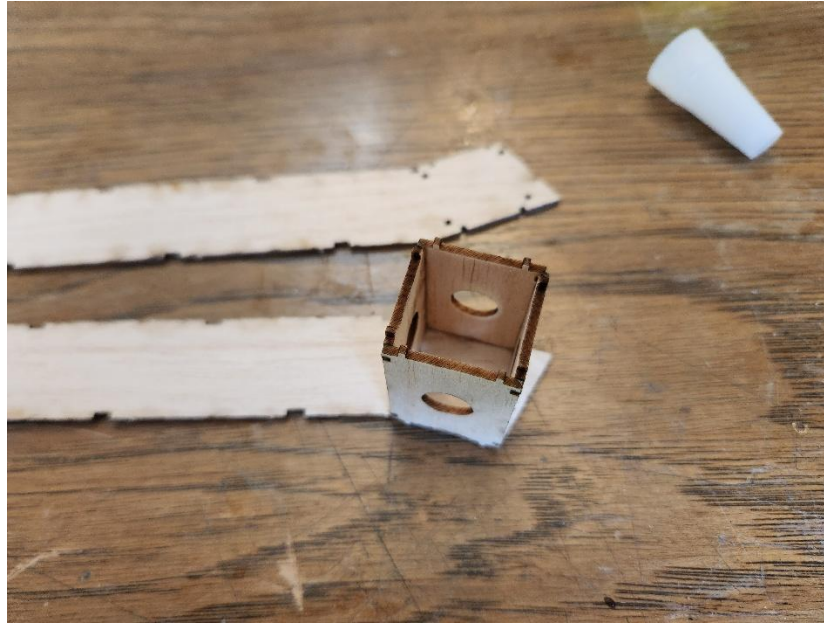


Remove the two boomilever compression section sides from the parts sheet. Clean out all the holes in them to allow proper fitment of the parts.



At each end of the compression members, there is a pattern of 4 holes and 4 notches which match up with the end keys of the boxes you just assembled. Carefully test fit the boxes to these patterns on the **blank (non-engraved)** side of a compression member before gluing them in place.

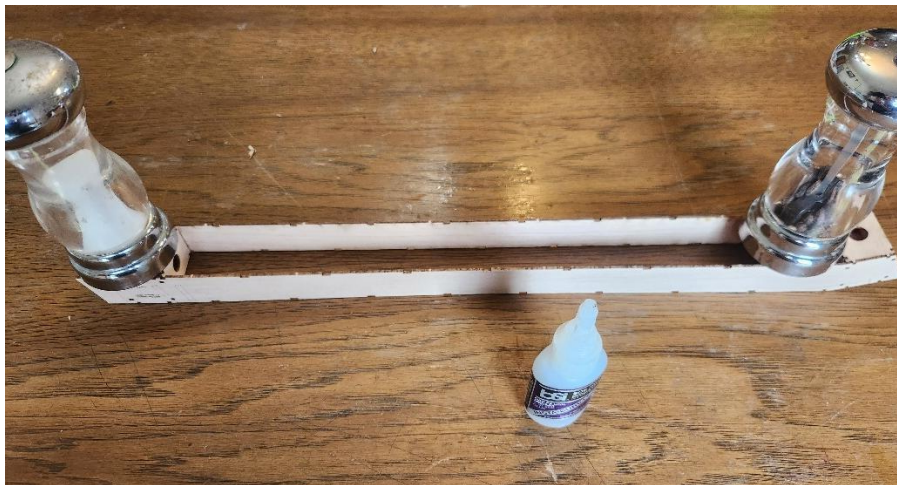




Now carefully attach the other compression member, striving to get it in place as straight as possible.



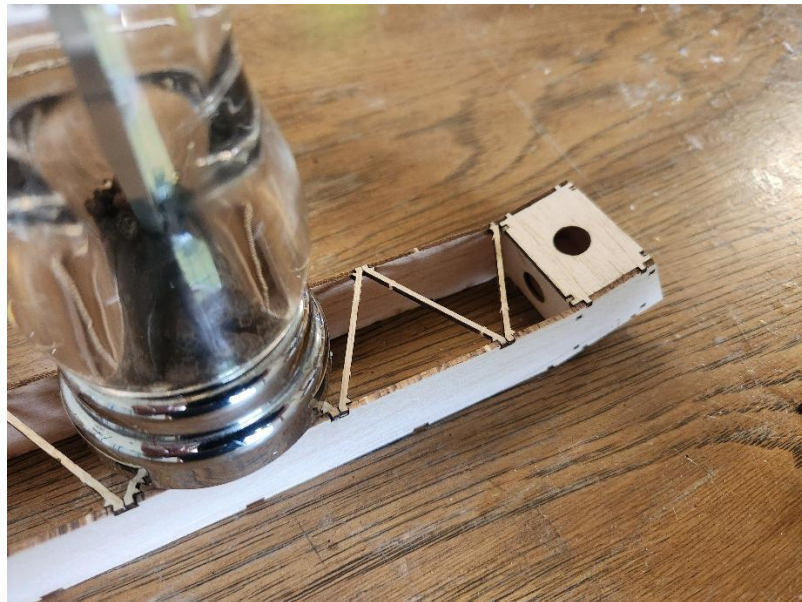
The compression assembly may twist during the above steps, and it will remain sensitive to build errors, so before installing the crossmembers, weigh it down with appropriately heavy objects on a clean, flat surface.

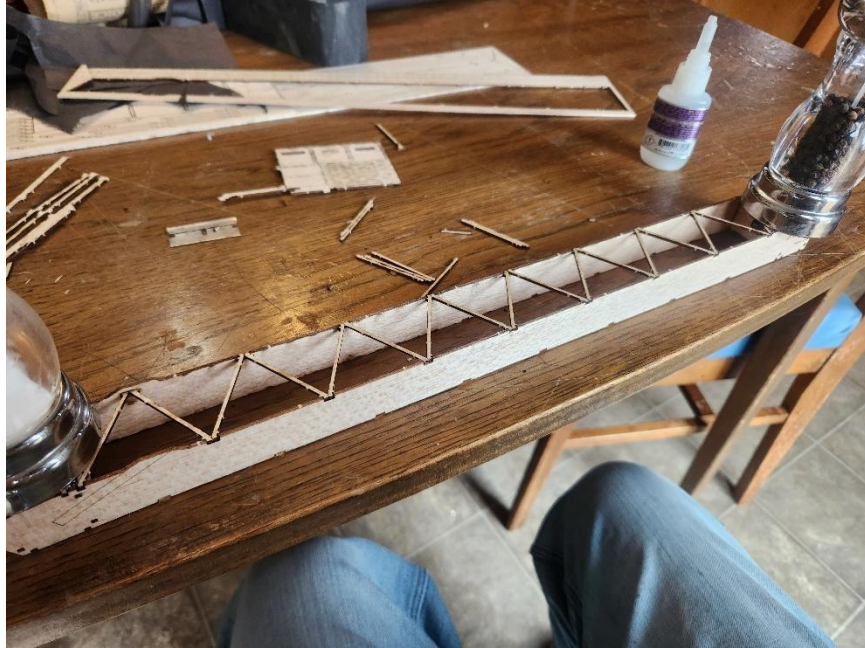


Remove half of the crossmembers from the parts sheet.

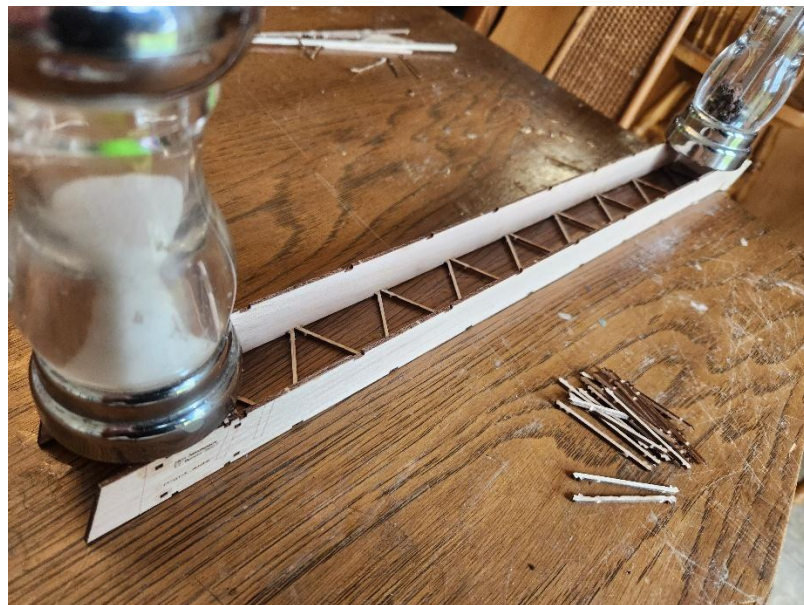


The crosspiece assembly arrangement represents a Warren Girder truss system. This means that the cross pieces are all diagonal in orientation to form a series of triangles. Start at one end of the compression assembly and work your way down. Note that at the loading end, one set of crossmembers have to be inserted into a hole in the side rather than a notch. Also note that except for the end members, all notches are shared between two members. Be careful to avoid getting glue into a notch and blocking the next cross member's installation. The photos below show the installation of the top surface cross members; the bottom members are installed after all of the top members are in place.

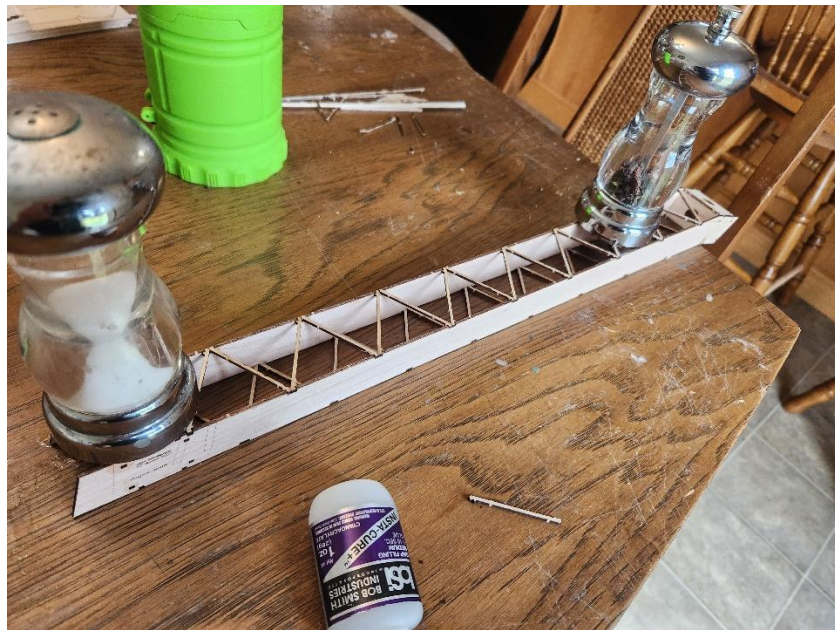
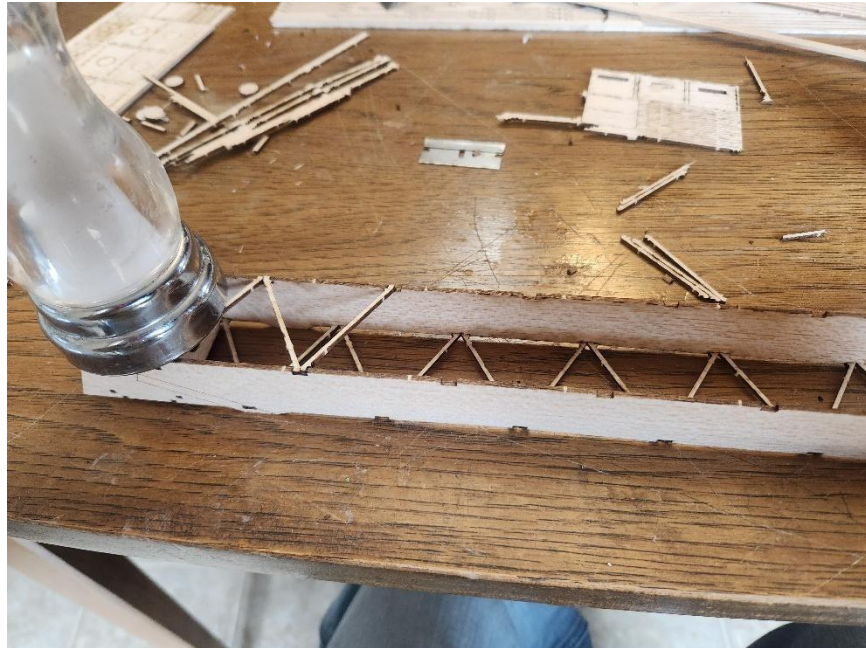




Flip the compression member over and weigh it down again so that the ends are flat on the table to avoid twisting. You will have to hang one end off the table to do this.



Remove the remaining cross members from the sheet and install them the same way you installed the top surface members.

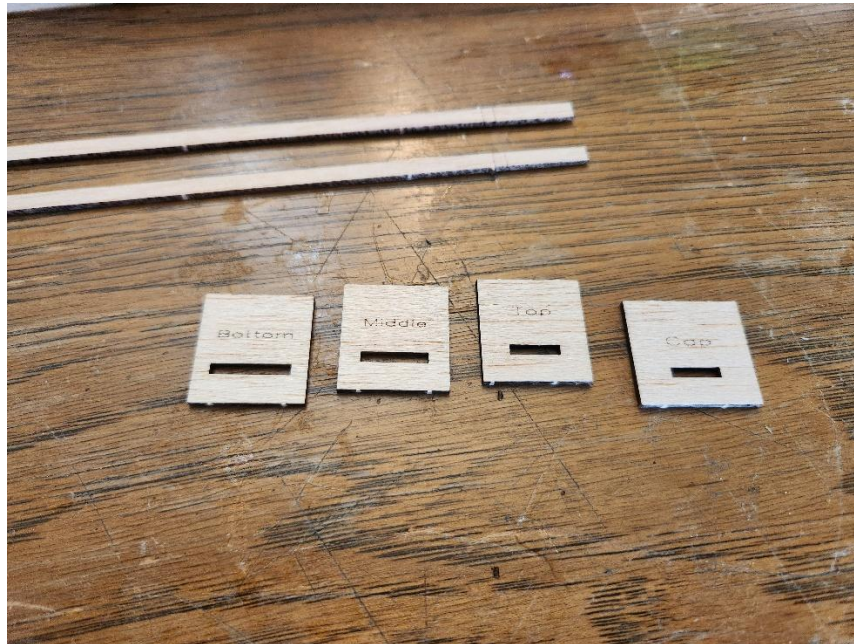


If you have kept the compression member flat on the table during the above process, it will be straight with no bends or twists.

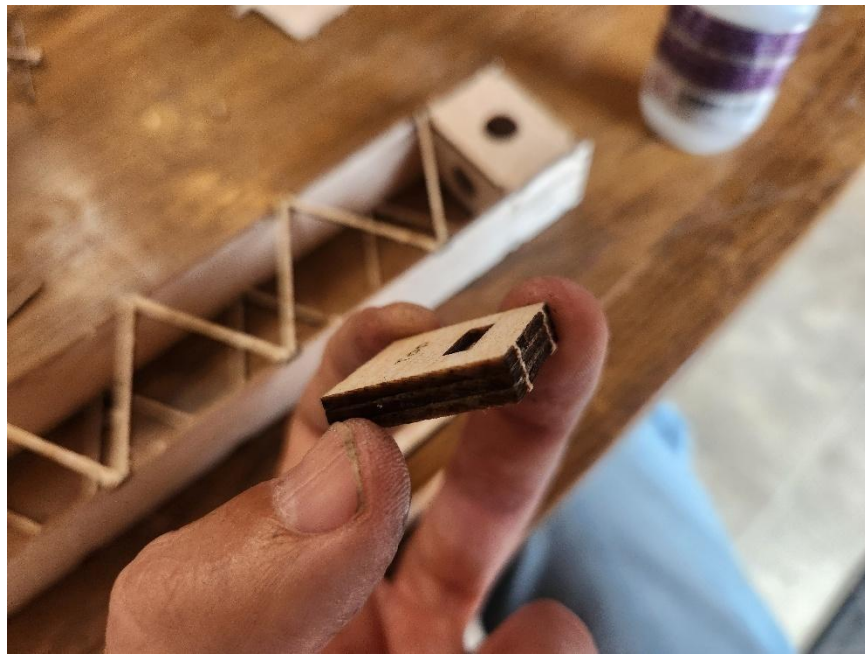
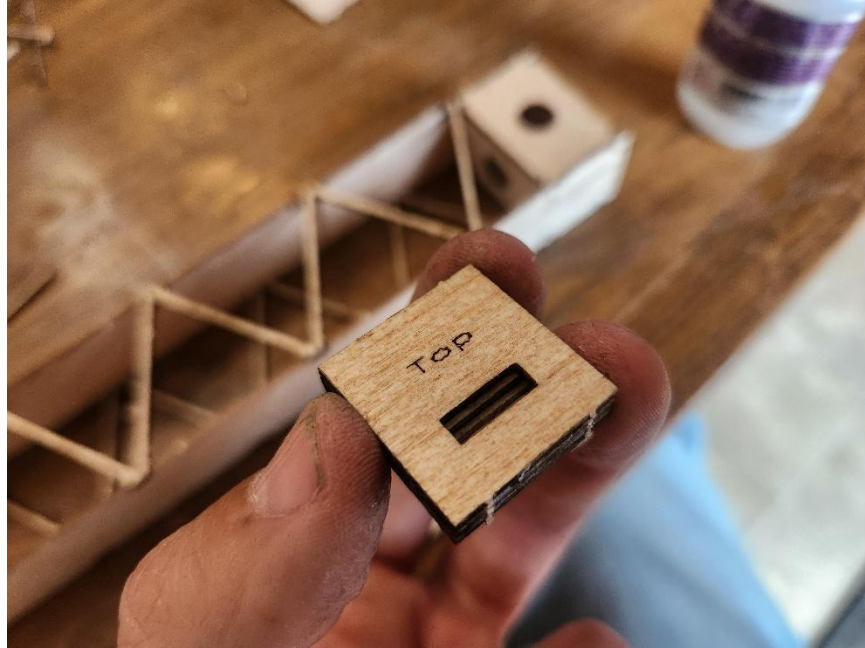
Remove the two tensile members from the parts sheet.



The tensile loading saddle requires careful alignment and order of assembly to get the slot to follow correctly through this component. As such, the parts are labeled “top”, “middle”, and “bottom”. The labels should all face the same direction so that the slots are aligned, as shown below.



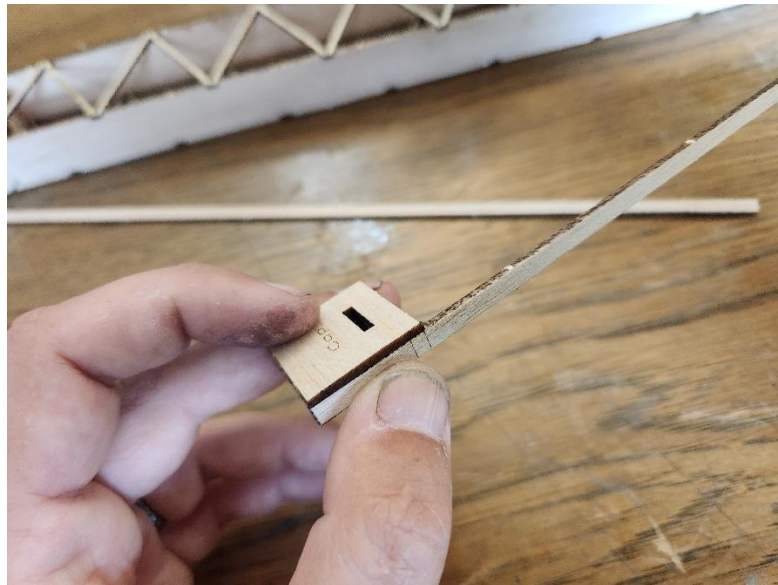




There is a cap which goes atop the tensile member so that additional attachment surface is formed. This part extends out over either side of the loading saddle. Align it very carefully as shown.



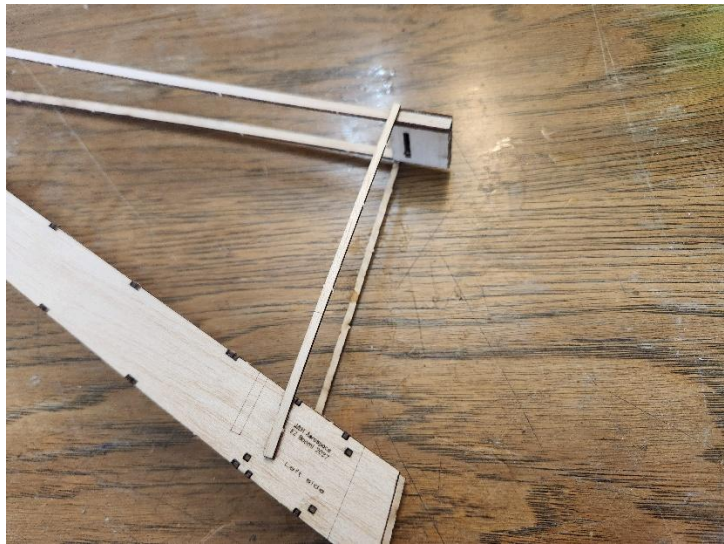
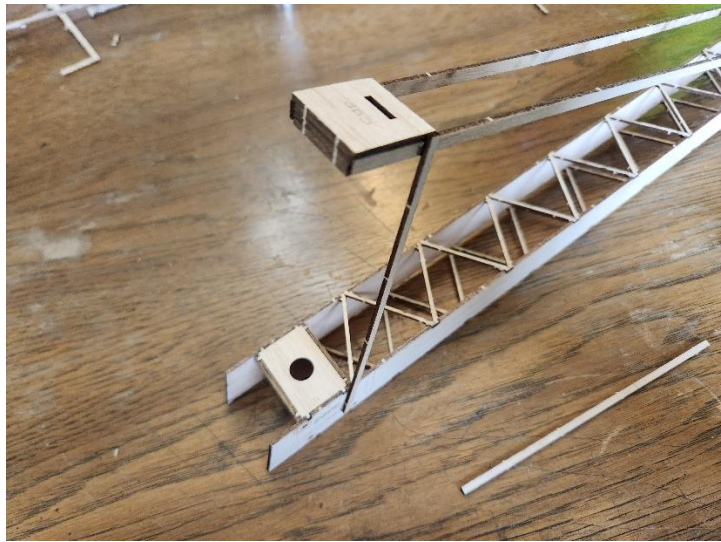
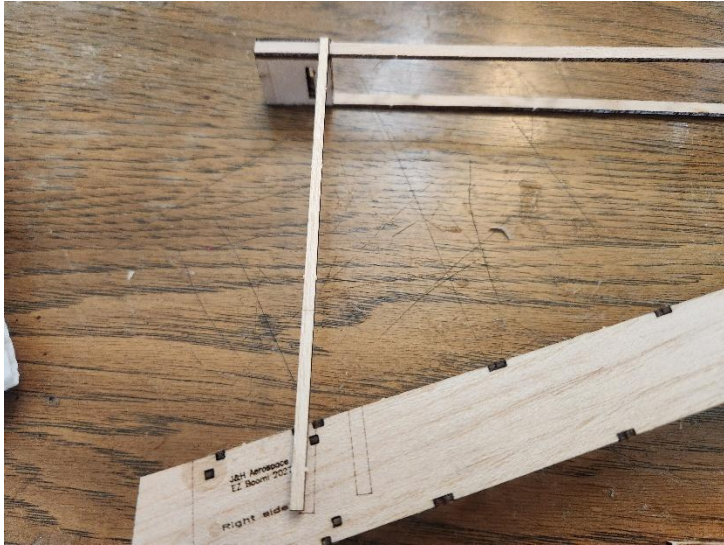
The gussets on the tensile members set their alignment in the loading saddle. Make their attachment secure, and make sure they are exactly parallel. Depending upon wood variation, swelling, etc, their slots can allow quite a bit of play. Any play can cause undesired bending loads or unequal loading leading to premature failure.



The engraved attachment lines on the side of the compression member set the bonding location for the tensile members. Note that two sets of lines are used. Use the ones shown below for the Div B Bonus configuration. While these lines are quite accurate, it is best to jig the entire assembly in place on a Science Olympiad Boomilever loading fixture to get exact alignment. Additionally, assembling in a fixture will allow ignoring the attachment lines in favor of a bonus achieving Boomilever. Regardless of your choice, the attachment must be made with care to ensure exact alignment of both tensile members.



Due to the angled contact point of the compression structure, a pair of tension stringers are needed to ensure no slippage occurs, which would cause instantaneous failure. Install the stringers as shown, using the alignment marks on the tensile unit and the sides of the compression section. Be sure to use the marks closer to the end of the compressive section, as the other marks are for the C Bonus version.



Congratulations! Your 2026 EZ Boomi is complete! We strongly recommend building multiple boomilevers and testing their load bearing capacity before competition. Even if you break the first one, you can use it to set an proof-load to test the others to a designed load so as to ensure that you have competitive devices for competition use.

