

Bamboo bow build-along



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'Stickbow Hunter'



Laminated longbow build-along



Stickbow Hunter

I am presently making myself a new laminated longbow and I thought the processes I use might be of interest to some folks on here. Please remember though that this is just how I do it and others may do it differently.

I will give an explanation on what I do and why and add photos. If you have any questions or don't understand anything please ask - I will try and give you a satisfactory answer.

I want to make the bow 66" long and around 70# at my 26.5" draw length. It will be of a reflexed, narrow limbed and deep cored design. I will be using laminations made from bamboo flooring (often called actionboo) and a riser made from Bubinga. I will be using clear glass.

I have already had one attempt at this bow and it went light at 65# so it has been put aside for now. Hopefully I have adjusted the core thickness sufficiently to get the weight right this time. I haven't used the bamboo flooring before trying it on these two bows so it was a trial (and so far error), in getting the core thickness correct.

Cutting laminations

The photo is the lams being tapered on my finisher. I won't go into much detail here as most of you would most likely buy your lams pre tapered.



The first photo simply shows the 4 parallel laminations I cut out of the flooring prior to being ground into tapered laminations. I will be tapering all 4 laminations which will suit my bow design.

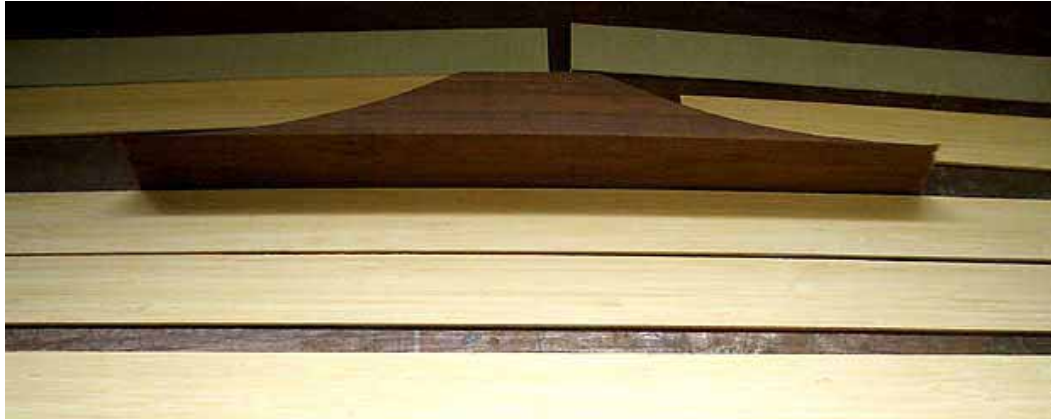
To cut the flooring we ripped it up into 40mm wide strips (width of a lam) and then to cut these the opposite way into approx 3.5mm thick pieces as per first photo. A normal bandsaw was used.

After this I then used my finisher to grind the lams parallel to my desired thickness. I then took my master tapers and ground the taper into the lams as explained in my second post.

Shaping the riser

The following two photos show how I shape the riser blank and thin the ends down to ensure very thin fadeouts. It maybe a little hard to see but you might notice that I support the fadeouts during the thinning process with another piece of board. This allows me to make the fadeouts very thin. You should be able to see through the ends of your fadeouts.

The next post I will deal with preparation for the glue up.



Gluing Up

Now that all the bits and pieces are ready it is time to prepare for gluing.

The first thing I do is place all the components into my hot box (gluing oven) for approximately 10 minutes or so. This will dry any external moisture that may be on them and will aid in evaporating any moisture when I clean the lams just prior to glue up.

While the components are in the hot box I spread paper out over my work bench so I don't get glue on it and prepare the other things I need.

In the first photo below you will see that I have my all important glue, which is an epoxy. I use Smooth-On EA 40 which is a two part mix similar to your common araldite. I have been using this epoxy for around 15 years and have found it to be exceptional.

The scales are for weighing the glue. It can be mixed 50 – 50 by volume but I prefer to mix by weight.

The butter container is to mix my glue in. When I'm finished it goes in the bin.

The black thing on the tins of glue is an old piece of bow glass that I use for a spreading the glue.

Lastly there is a piece of CLEAN rag which I wet with methylated spirits (forgot to put that in the photo) and wipe all the components before gluing.

I now use some good old cling wrap and place to layers over my bow form. This stops you gluing the bow blank to the form. (See second photo below)

Next I take all the components out of the hot box and wipe every single piece thoroughly with the methylated spirits. This is VERY important as it removes any grease or oil, which comes from your fingers, and also removes any dirt. You might be surprised what fine bits of dirt come off the lams when you wipe them. The metho will evaporate very quickly from the heated components.





Glue up.

I now mix my glue. Be sure to thoroughly mix it. I usually mix it for about 3 minutes but this is just habit.

When ready I take my spatular and starting with the back piece of glass I spread an even layer of glue on it. This first piece was already lying on the form as in the last photo above. I then coat one side of the next lam and place the two glued sides together on the form. I do the three lams and then I glue the handle and place it on the form and finally I do the belly lam and glass.

NOTE: Every surface which forms a glue line **MUST** have glue applied.

You don't just put glue on one lam and place the next one on top. You must have a glued surface being joined to another glued surface. This is to ensure that you get good glue coverage and that no small area is missed.

Once everything is glued you now have to clamp it together. When everything is glued it becomes rather slippery. I use that clear fibreglass reinforced tape to help hold things in position while I get the top part of the form in place. (see second photo below)

After taping things in place I put a layer of cling wrap over everything to stop the air hose etc sticking to the bow blank.

I now lay thin metal pressure strips on top of the bow blank (see photo 3 below). These help to evenly distribute the pressure of the air hose over the surface of the lams. These are held temporarily in place with some masking tape.

The air hose is now laid on top and the top part of the form is put in place and bolted in position. (see photo 4 below)

I then inflate the air hose. I only inflate it to around 20 pound pressure to start with and leave it for a few minutes. This allows any air that may be trapped to work its way out. Later I inflate the hose up to 65-70 pound pressure.





Bamboo Bow Build-along by Stickbow Hunter



Heat curing

The whole thing is now placed in the hot box. (see photo 5). I have the temp set at 60 degrees and leave it on for around 8 hours. I usually leave the bow blank in the form to cool over night and take it out the next day.

My hot box is made from 12mm ply and the heat is generated by the use of ten 100 watt bulbs. The temp is controlled by a thermostat.

Time to wait for the glue to cure.

As stated above I cure at 60 degrees. I would imagine the pressure in the hose does increase with the heat - I haven't checked because the hose is a small area and you lose pressure very quickly just trying to check. The pressure is always lower when I take the form out of the hot box though. This may be due to the hose expanding under heat.

Well the next photo shows the bow just out of the hot box. You can see the amount of excess glue that has been squeezed out. Be very careful as these glue dags can be very sharp and I have had quite a few cuts over the years. This excess glue has to be sanded off before marking the bow out.





The above photo shows the bow marked out and as you can see I have already cut the limbs to rough shape. This was done using a Triton bench and the saw blade was tungsten tipped.

The next thing to do (I forgot to get a photo) is roughly shape the handle till it looks like photo three. I use what I call an electric rasp – a Makita angle grinder with a sanding disc fitted – to do this shaping. I use a 36 grit disc and it removes the bulk very fast so you have to be careful. One slip and you can ruin a bow.



Shaping the limbs

The next process is to sand the limbs to exact shape. To do this I use another finisher. (see next photo) I take this very carefully as it is VERY easy to put a woop (indent) in the side of the limb.

I also use a flat board approx 400mm long with sandpaper attached to it. I use this to hand sand the sides of the limbs to get them nice and straight. (see second photo) The next step I do is cut rough nocks in the limbs so I can string the bow and weigh it. I know a lot of bow makers will do their tip overlays first before cutting string nocks but I like to know if I got the weight right before spending more time on the bow.





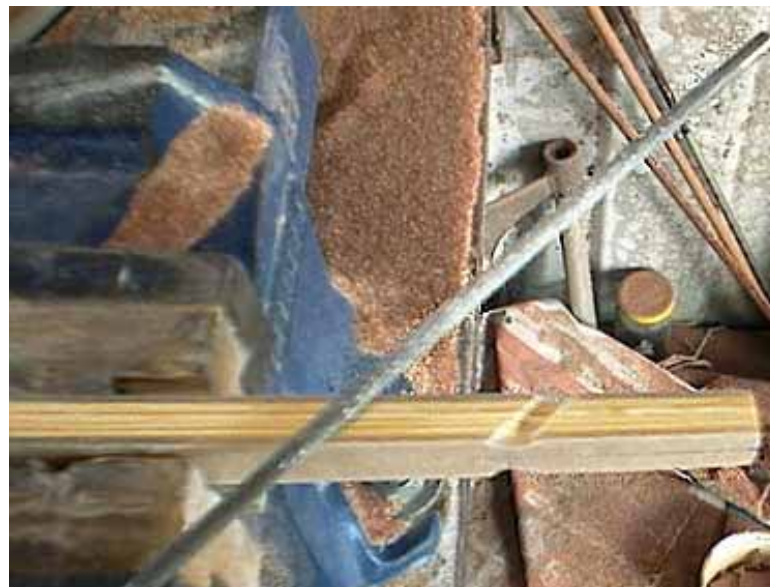
Shaping the string nocks

The first thing to do is mark where the nocks are to be placed. (first photo)

I then make a very shallow cut along the marked lines as a guide for filing. (second photo)

I then file the grooves to a depth that will hold the string. Care must be taken to line up the grooves on both sides of the limb. (third photo)

Before stringing the bow I sand all the edges of the glass to make sure there are no small splinters or nicks that could lead to the glass splintering along an edge. Next I take an appropriate length string and string the bow up.





GRUNT!!! 🤖 Yep I think I made weight no worries this time around. 😊

On weighing the bow it came in at 73# which should work out just right. By the time I tiller the bow and round the edges a little more it should be bang on 70# which is what I was wanting.

For interest sake I made the core .015" thicker than I did for the 65# bow. Doesn't take much extra core thickness to increase the draw weight substantially.

Onwards we go. The next job to tackle is gluing on the tip overlays. I use three layers – two of glass and one wood. I normally use the same wood type that is in the riser.



Limb tips

With the first piece of glass I bevel the leading edge so it is easier to blend it into the limb later. I then roughen each gluing surface with 40 grit sand paper and then wipe all surfaces with methylated spirits.

I glue the pieces on using the Smooth-On. I clamp them using a couple of small 'G' clamps. I then put the bow back in the oven and heat it to around 40 degrees for a couple of hours.





The first step from where we left off was to shape the handle. (see next two photos)

The next process is making the sight window and shelf. Notice I am left handed. I use a couple of different rasps and a rattail file to do this. When you work laminated bows always work from the outside towards the centre so as to not chip the glass.

You will see in the photos that follow that I radius the shelf as well as the sight window. This is so that the arrow only makes contact with a very small portion of the riser. By doing this, if you happen to torque your bow hand it won't affect the arrows flight.

I also have the shelf so it is just above my hand. I shoot instinctive and I find it helps to have the arrow as close to my hand as possible. In the second photo of this series you will see how I support the bow while working on it.





Now that the shelf is done it is time to check the tiller. I had to weaken the top limb slightly to get the bow to tiller properly. I find about 1/8" to be about right for my bows. The distance between the string and the fadeout is 1/8" more on the top limb. The top limb has to be weaker because the arrow passes the bow above centre closer to the top tip. If you don't tiller properly the limbs may return at different times causing hand shock and poor arrow flight.

While I have the bow strung I check the alignment of the limbs. The string should run along the centre of the bow. I also weigh the bow. It came in just on the 70# I wanted which was pleasing.

Well the next step is to do the final sanding. To do this I used 180, 240 and 320 grit paper.

Once all the wood and bamboo surfaces have been sanded it's time to remove the masking tape. Once this is done I sand the glass with 240 and 320 grit paper.





I now give the bow a final look over and if I'm happy with the finish it's time to spray the bow.

I use my garage as a spray booth. I have a piece of ply approx 400mm high which fits in the roller door opening. I close the roller door onto it. I have an exhaust fan fitted into this ply. It is a little hard to see in the photo as it is right behind where the bow is clamped.

I use a two pack car paint to spray my bows. Being a two pack it means there is more work in cleaning up but after a lot of experimenting I found this to be the most durable finish and well worth the extra effort. I have been using it now for around 15 years.

Before spraying the bow I wipe it thoroughly with 'wax & grease remover' to make sure there is no oil from my fingers on the bow.

I use a finishing gun to spray with as you only use a small amount of paint. With the paint you have to use a special reducer (thinner) because of it being a two pack. I also use some 'flex-aid' in the paint because of the limbs of the bow having to bend (flex).

Once I am ready I spray the first coat and leave over night. Make sure you use a good quality respirator as the vapours from two pack paint aren't real good for you.



Well I have finally got around to finishing my bow. The first photo is of me putting contact cement on the handle leather.

The second photo is of the handle leather finished.





The third photo is of my string jig as I was making the string for the bow.



This photo is of the finished bow just before I shot it for the first time.

This last photo is of me nearly at full draw – I had let down a little as my wife was a bit slow in taking the photo.

After shooting the bow I must say that it was quite nice to shoot. I could certainly tell I was shooting the heavier weight but give me a week and I think it will feel good.

Anyway that is a brief outline of how I make a bow. I hope it was of interest and that it may have inspired some of you to have a go at building one yourself.

