

# Hollow Wooden Surfboard

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## Introduction

The decision to make a wooden surfboard started as an idea that sounded cool at the time, but if I had known the amount of work involved I may have changed my mind! However, it has been an interesting project and I have learned a lot about surfboards.

I would like to thank the following people for their help with this project:

Dan Perrett - He gave me the epoxy resin that I used. He also helped me source the fibre glass cloth that I used and shipped it up to Papua New Guinea for me from Australia.

Brian Montei - He gave me the balsa wood that I used for the rails and other bits and helped me cut it into the required strips.

Michelle my wife - She was extremely patient with me considering the amount of time I spent on it!

I modelled my wooden board on a 7ft 4 mini mal that I already had. I used AKU Shaper (can be downloaded from the internet) to create the 3D model and then used another download called Hollow board template maker to create the templates for a wooden board. This produces a big PDF document that you cant print out on a normal A4 printer. I then used a PDF splitter program (also downloaded) to take the huge single page PDF and create a multi A4 page document that I could print out and stick together and create the templates.

Because I live in Papua New Guinea, getting hold of materials and glues and other necessary items is difficult. For this reason and also because I wasn't sure of my ability to build a board like this, I elected to go really cheap and treat this as a test board. If it turned out well, then I would consider putting in more effort and making another one with really good timber.

So, with this in mind, I used 4 mm plywood as the timber. Typically these type of long boards use a 6mm deck, but in order to save weight I used the 4mm ply and added in extra ribs for strength. Although they added in more weight, the overall weight was reduced. I also made solid rails from balsa wood.

Unfortunately I don't have pictures of this phase of the project as it was in the early design phase and I was still not sure I was actually going to build it.

At last however I decided that it was time to build it and so I cut out the ribs and stringers and commenced building. And so the project started...

## Ribs and Stringers

Some guys use fancy tables that can be adjusted for the rocker etc. I didn't want to make a lot of special tooling, and so decided to use a flat table and jig the board as I went. I laid out the centre stringer and used blocks of wood and hot glue to keep it straight. I then added the ribs and the side stringers. Once they were in place I straightened everything and again using blocks and glue I jiggged everything as straight as I could. Once that was done, I applied the wood glue. Usually I had to remove the item I was glueing and then reinsert it once I had applied the glue.



### The Top Deck

Once the ribs and stringers were laid out and glued I could start with the deck. I had decided on a basic pattern and because the plywood top and bottom had slightly different shades I was going to use different sides of the plywood to create the pattern. I didn't have many clamps, and so used a technique of tying the wood to the frame in sections as I went. I had to be careful to keep the edges of the wood closely aligned in the vertical as any offset of more than about 1mm meant that during the sanding I would sand through a layer of the plywood and the colour of the next layer would show



through and ruin the pattern on the board. I started with the centre piece and then continued outward gluing one extra piece every day. I could only do one piece each day as the glue needed to dry before I could do the next one. So the top deck took about 2 weeks.





Glueing the deck near the edges became a bit tricky as the deck curves down quite a bit and the wood was difficult to bend. Some creative clamping was required!



Once the deck was completely glued and dry, I could trim around the edges with a jig saw and now the board was ready for some internal wood blocks and the bottom deck. Before I continued however I gave the top deck a preliminary sanding to see how it would come out.



### Inside the Board

Within the board, you need blocks of wood (I used balsa) to fill up some areas where you will need strength. So, everywhere you need to attach a fin, and where you are going to put the leash plug. A hollow wooden board also needs a vent plug so that it can breath when you are not surfing. I added sufficient balsa in the rear of the board to allow for various fin configurations as I hadn't decided on the final plan yet. I also added some strengthening plywood near the nose for the vent plug.



### The Bottom Deck

Once all the inside stuff is done, you can glue on the bottom deck. You have to make sure you have not forgotten anything because after this there is no turning back!



Because the bottom deck is flat, it can be glued on in one go. It was a little tricky to make sure everything was aligned and that there was no twist in the board, especially as I didn't have a very rigid table to work on. I employed the use of my wife to help put the glue on so that it didn't start to go dry before I was ready to put the deck on.





Once the bottom deck was glued on, I could trim around the board again with a jig saw and then sand around the edges to prepare for the rails.

### **The Rails**

Unfortunately I have no pictures of the rails being done. This I did by using strips of balsa that I glued around the board in layers. I started with a 4mm layer and then did 2 more layers of 10 mm each. It was a bit tricky to get the 10 mm balsa to take the bend around the edges, but it was still quicker than doing more layers of the thinner wood. It took about 6 days to do the rails doing one glueing per day. I had to do each layer on each side in two lengths because of the rocker on the board. At the nose of the board, because it is a round nose, the balsa cannot bend that much, so I took it as far forward as I could and from there relied on the nose block that would be added later to achieve the desired shape.



After the glueing was done, it was now time for some major sanding to get the rails to the correct shape. I used a combination of an electric sander for the initial rough sanding and then a hand sanding block to achieve the desired rail shape. So, this was where my shaping skills came to the fore! I had researched rail design a bit and so tried to achieve what I thought would be a good design. The rail shape tends to change from the front to the rear of the board and so it can be time consuming and you have to work carefully to ensure that you don't take off too much material and ruin your board.



### The Nose and Tail

To achieve the nose and tail shape I used some balsa blocks. These I glued on to the nose and tail and once again there was a lot of sanding needed to achieve the correct shapes.



Here is the board with the nose and tail block glued on and ready for sanding.

### The Finishing Touches

Once the board was completely sanded I added a logo. Because there are no facilities here in Papua New Guinea to print stickers etc, I had to paint it on by hand!



The finished board, now ready for glassing!



## Glassing the Board

Glassing a board is considered to be quite hard, especially to get a good finish. So, I was quite nervous about this part, especially as you can easily mess up weeks of work in one easy step!

It turned out to be not as hard as I thought to do the actual layers of glass. I did one layer on the top and one layer on the bottom of 6 ounce E cloth. I also used epoxy resin, Araldite LY3600.

There is lots of information on the internet about how to do this, below are some pics of me glassing the top deck.







As I mentioned it turned out to be relatively easy to glass the top and bottom deck with the fibre glass. Once that was completed I now had to do the gloss coat. This turned out to be a little more challenging. I had been working outside and had no problems up to this point. However, the day I decided to do the gloss coat it had been raining and without realising it, there were a lot of bugs around. As it was drying, these tiny bugs were landing on the board and getting stuck! So, after it dried I had to sand them out. Also, the curtain of masking tape that I used came off during the process and so the resin ran underneath the board. I tried to get most of it off, but it resulted in me needing to sand quite a bit on the bottom of the board before doing the gloss coat on the bottom deck.

For the bottom deck I had learned a few things and so I worked inside for this job and I also used different tape for the curtain. This worked much better and the result was a much neater finish.









Above is the bottom deck with the gloss coat completed and busy drying. Note the thicker (and more sticky!) tape that I used as the curtain to prevent the resin running underneath the board.

Following the gloss coats I sanded the board down again to try and remove most of the imperfections and lumps and bumps. I then did two more coats of resin (some call this the hot coat, but technically with epoxy you cant do a hot coat). Either way, it is the final coat that is used to get the polished finish.





Once I had completed the final resin coats, the board had to be sanded again, and then I fitted the vent plug in the front of the board to allow it to breathe. I used a small brass vent. It is a manual vent and you need to remember to close it before surfing and open it again afterward.



After fitting the plug, I had a lot of sanding with progressively finer sand paper to get the polished finish. I started on 600 grit and went through to 1500 grit. Finally I buffed it with a lamb wool pad.





Finally the basic board was done!





Still to follow is the fitting of the fins and the leash plug, but I haven't actually done it yet and it will have to wait until I can get the fins and the plugs because you cant get them in Papua New Guinea.