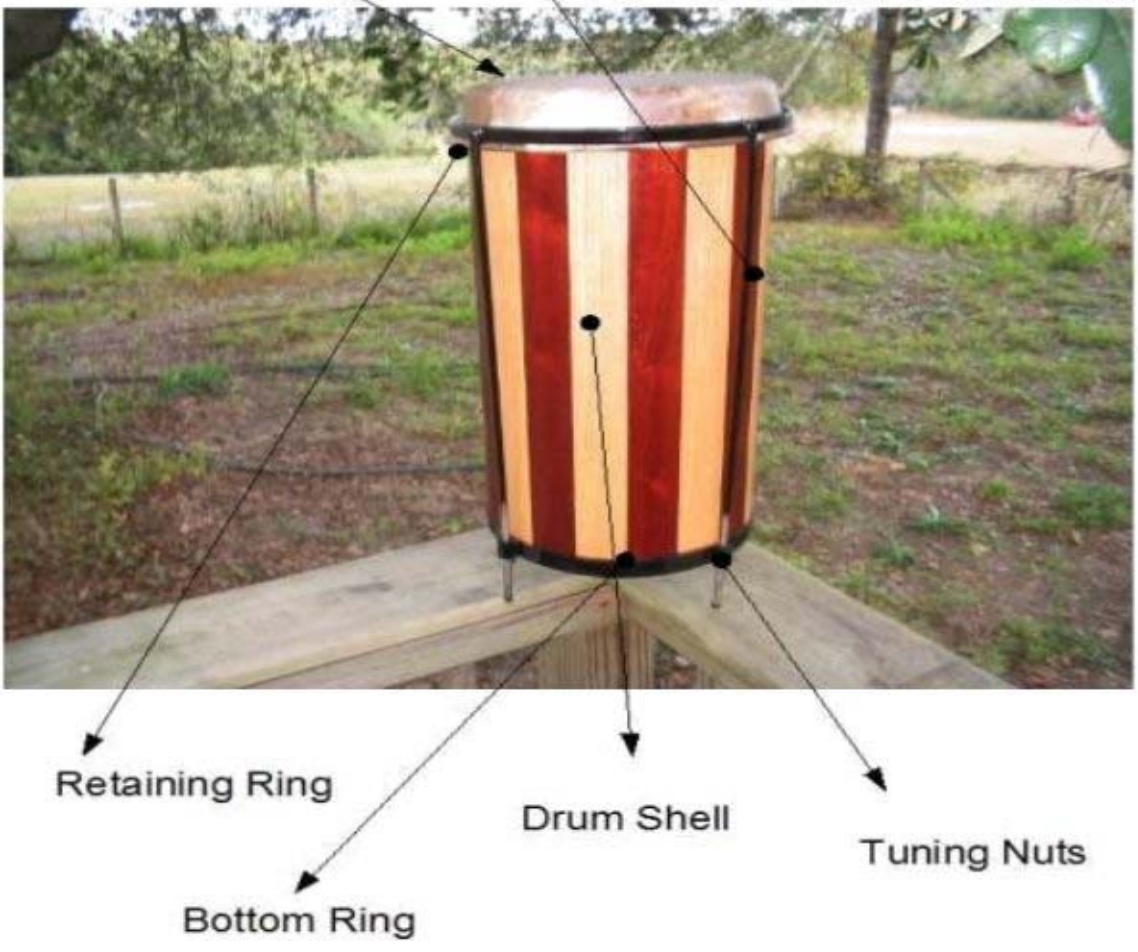
HOW TO BUILD A KETE HAND DRUM

BY BLAMINACK



Greetings. This is a picture tutorial on how I build a Kete drum. Kete Drums are made and played by Rastafarians all over the world and they make up part of the Nyabinghi Music that developed in part into Reggae. These drums descend directly from African percussion instruments.

While I am not a Rasta, I have a huge amount of respect for the music and the culture of Rastafarians. My love for the music and a love for working with my hands led me to learn to build these drums. In this tutorial I make no claims to be an expert on Drum Building. This is just how I do it, but it is my desire to show respect to the originators of these great drums, by doing my best to build a quality instrument that honors their music and talents. I want to share what I have learned with you. I want you to be able to build a drum that you will cherish. I want you to build a drum to give to some one else. Share the vibes! Spread the power of music. Spread Jah Vibes!

Blessings and respect!

As a disclaimer, I want you all to keep safety in the forefront of your minds. There are many things in this tutorial that if done in a haphazard manner sever injury could result. Be safe. If you are not experienced in something get help from some one who knows what to do. That being said… if I can do this, you can too. This is not genius work. Some of it takes practice, but you can build a drum that you will be overjoyed to show to others and play. Now on to the tutorial…

Materials and Tools needed: (look on Ebay for Wood and tools!)

Wood, obviously. It takes about 2 planks of 6"x ¾ x 8' to build a Kete drum… more or less.

Drumhead. Traditionally goatskins are used, but I have seen Kete drums made with calfskin. Typically, I purchase the skins on E-bay; however, there are other sources on the internet. I prefer African goatskins with hair on them. They haven't been treated with any chemicals and, supposedly, due to the climate, they have a thinner hide. I hope that using African hides will also lend support to the local African economies, at the same time using a material that is a by-product of one of the major food sources. These hides are rawhides, not treated leather. Some people will prefer not to use natural hides at all. For traditional purposes, I have always used natural hides. I have not tried any of the synthetic drumheads, but there are some available at www.**remo**.com . I use the center of the back because this is where the thickness is most consistent. They tend to thin around the edges and are not consistent. If you are making small drums, you may be able to get two drumheads from one hide, but typically, I use one hide per drum. I will cover more on this in the section of the tutorial that discusses handling the goatskin.

You need an accurate table saw, and a circular saw…for milling the wood into the correct sizes and shapes.

A four-inch angle grinder, with a grinding wheel, a cut off wheel and a sanding disc.

You need a means to sand the wood. I use a pneumatic sander. This runs on compressed air. The one that I have is designed for auto bodywork. It has a random orbit.

Sand paper.

You will need to finish the wood… I use polyurethane. There are many options here.

I also use a router. This is not an absolute necessity but it makes things much faster than the alternative.

You have to glue it together. I use Titebond II wood glue. There are several options here but keep clean up in mind. You DO NOT want to use polyurethane glue such as Gorilla Glue. You have to use your hands and these will not come off skin!

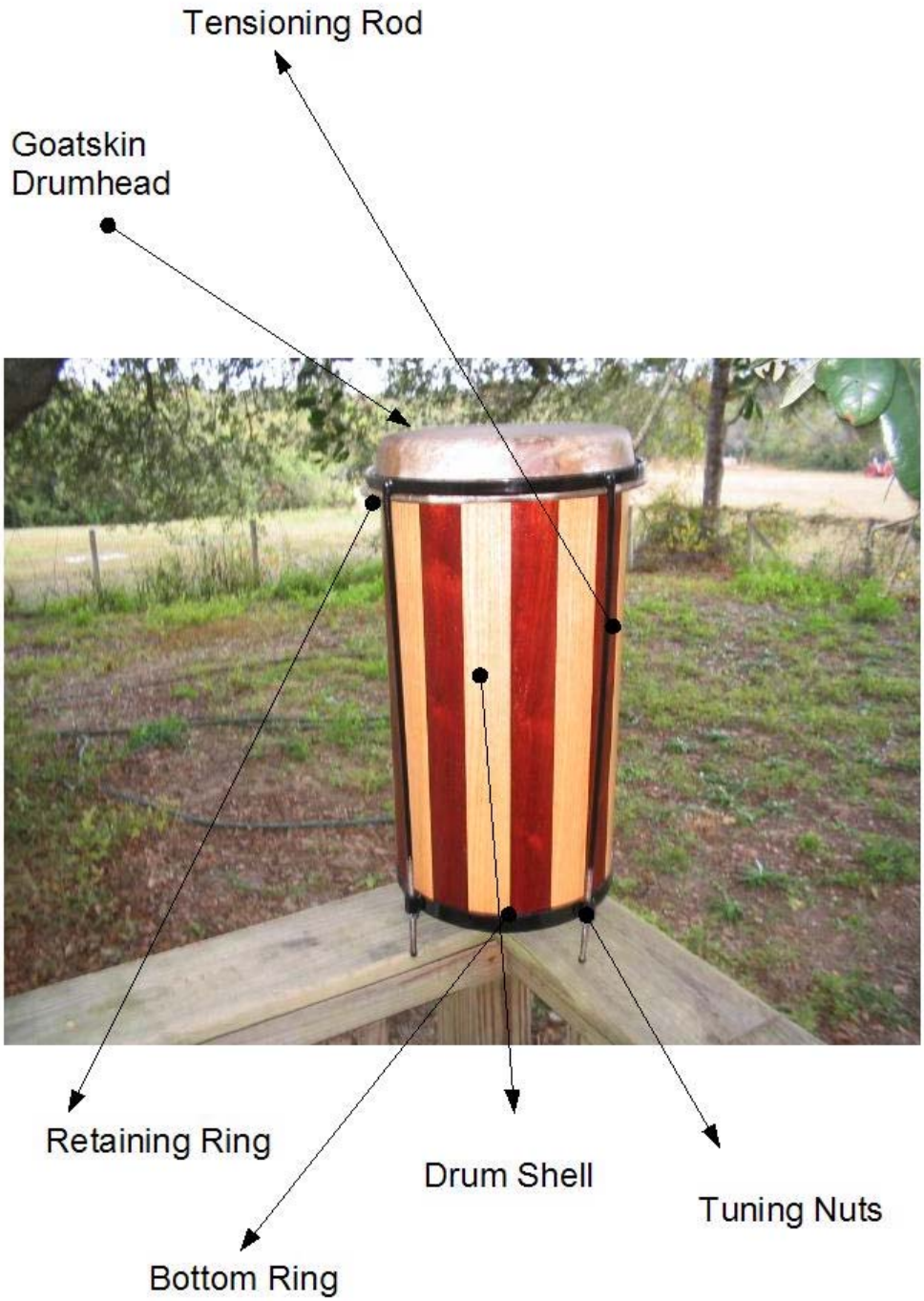
You will need a means to weld the metal parts. I bought a small wire feed welder for this. I love this thing! For some reason my wife won't let me keep it in bedroom though… I have no idea why… Many of the drums that I built I had the welding done by friends, until I bought a welder.

You are going to need ¼" round cold rolled steel to build metal parts from… I cover some of the options for this in the later parts of the tutorial… I also use two pieces of flat "plate" steel to build rings from, but you can use the same round steel mentioned above…

¼" All thread rod or a means to cut threads…

You will also need a couple of cheap single blade disposable razors for shaving the goatskin. I prefer Bic Razors that have the white handles and the orange blade cover. I cut off the protective edge to expose the blade and then at 45-degree angles, just slightly in the corners of the blade, I sand them round. Just about a 16^{th} of an inch is all that is required. I do this to prevent gouging the hide as I remove the hair…you'll see.

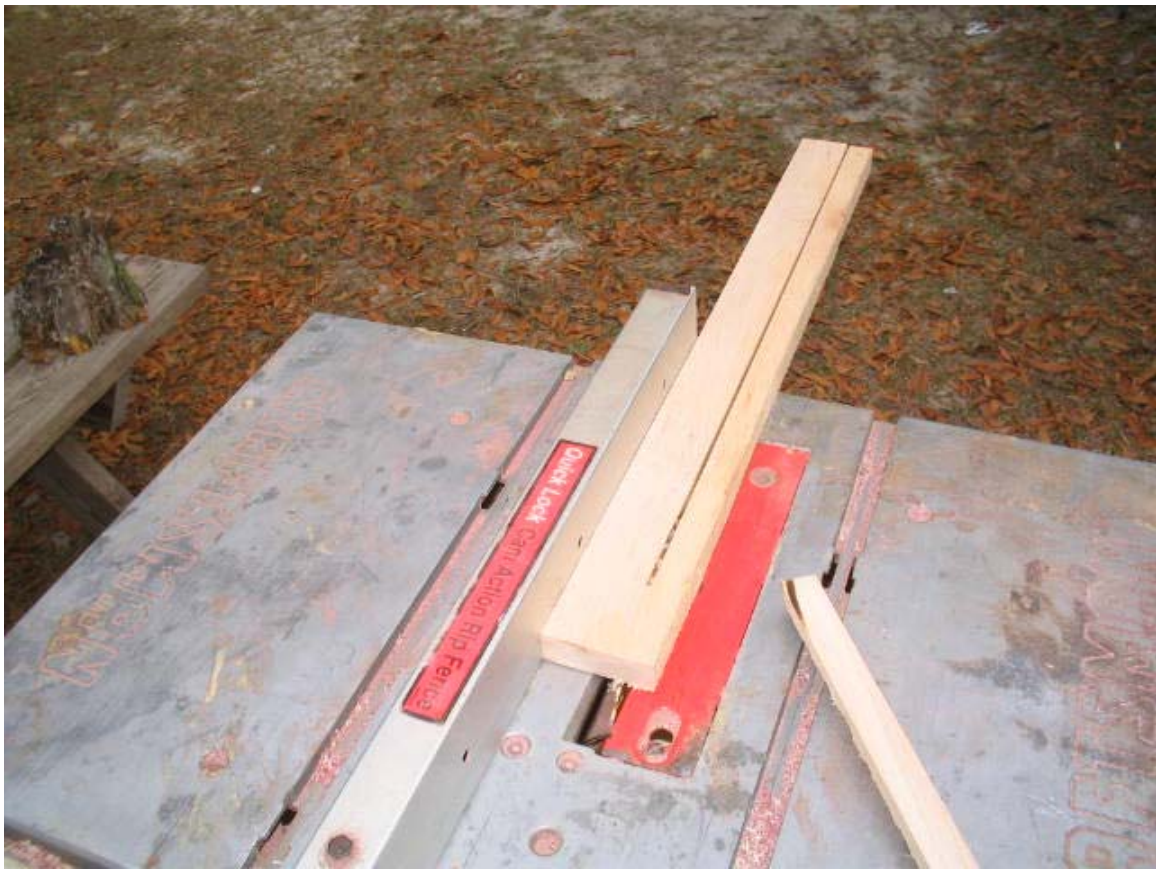
Before we go on I am going to give you a few terms that I have used through out the tutorial, so we can all understand what I am talking about…. (These are my terms, and may not be the technically correct term, because I have found no reference materials on Nyabinghi Drums.)



Ok good enough. Let's get started!

This is the raw lumber…. maple on top of the purpleheart. You can use a variety of woods. Keep in mind, some of the more musical “tonewoods”. There are many, kinds of wood that make great instruments. I suggest that you look up instrument woods for examples: maple, oak, ash, mahogany, etc are some that I have used. Keep in mind that some exotics are being exploited and make environmentally conscious choices. No vibes in killing the last tree!

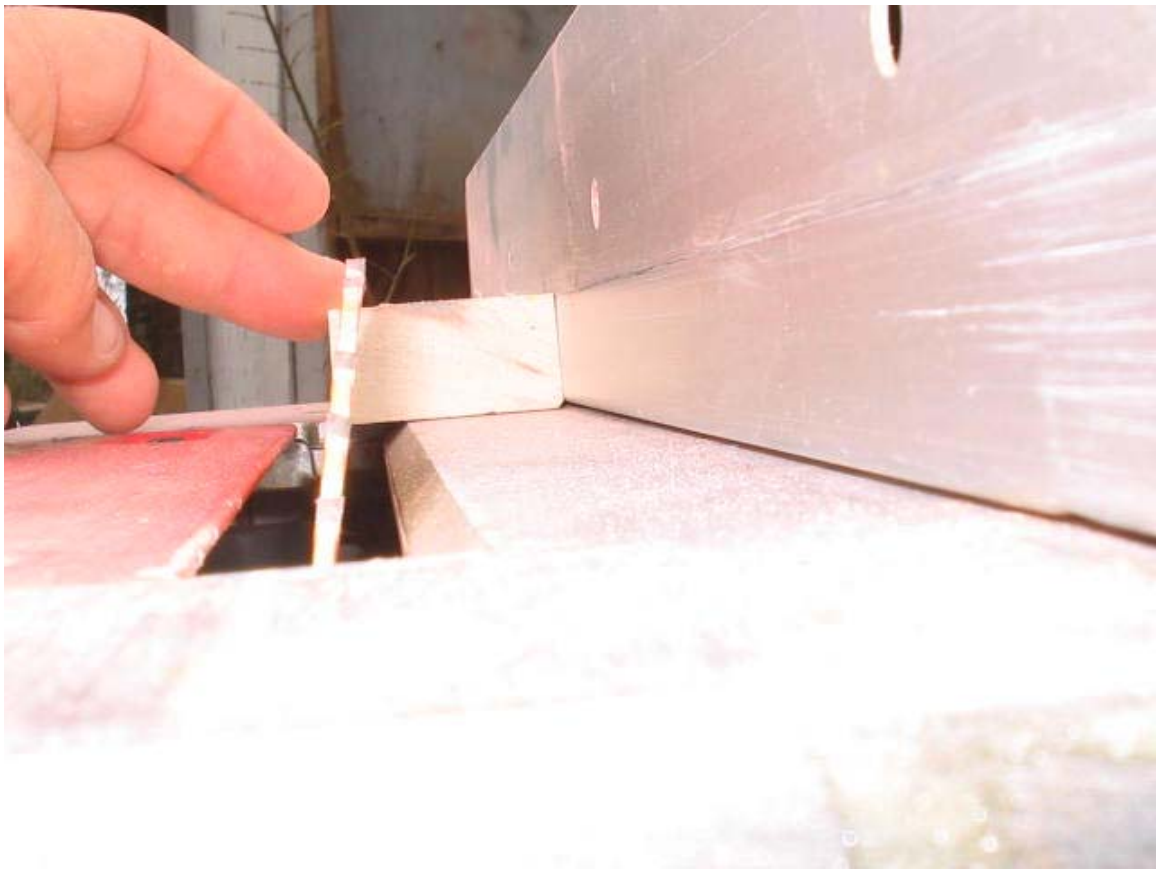
Look for woods that can be recycled! I have built many quality drums from scrap wood. Look for shipping pallets and containers etc. Just make sure to remove nails etc.



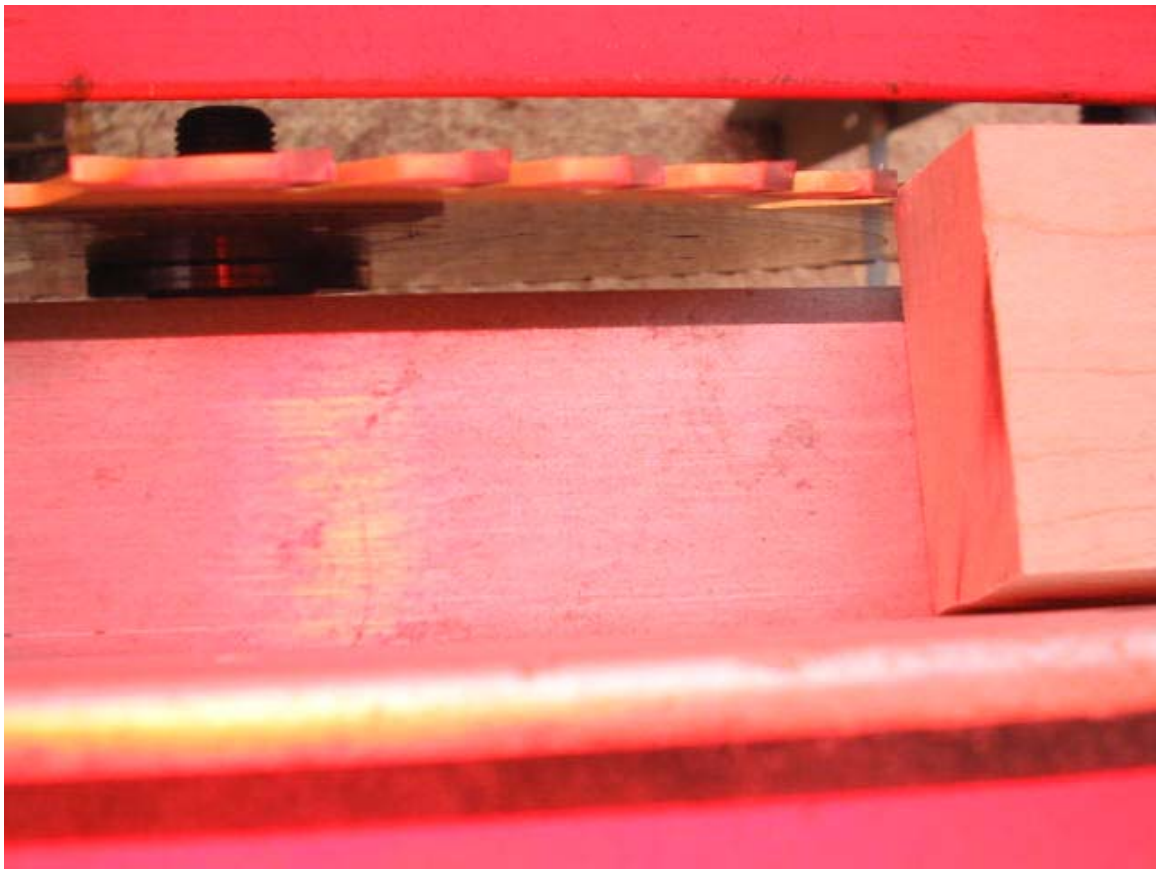
I am building a drum from staves. Staves are the individual pieces of wood that create the shell of the drum. This is how I cut the staves… all to 1" and 5/8" in this case. If you want a larger drum use wider staves. The amount of staves determines the angle of the cuts on the side of the staves…. You can figure out the correct angle by using the following method… amount of staves x 2, then divide 360 by that number. I use 18 staves so it will look like this… 18x2= 36. 360/36=10. 10 here is the degrees to cut the angles. If you use 16 staves you will cut to 11 and ¼ degrees. I like using 18 staves because the more staves used the easier it is to make the drum round. And getting a setting of 10 degrees on the table saw is much easier than 11 and ¼ degrees…

After all of the staves are cut to 24”x 13/16”x1 and 5/8”. Now they are ready to be cut to the proper angles, I am using 18 staves so that makes the required angle 10 degrees.

Here is how I set the table saw. The rip fence must be set so that the edge of the wood is JUST BARELY being cut. The angle of the blade leans in toward the rip fence…



Here is a picture of the desired cut…. Saw is unplugged!



Top view. Notice that the tip of the blade is just barely getting any of the wood. It must begin to bite there. After all saves are cut on the right side, you must adjust the rip fence to cut the left side. Cut the left side the same way, with the same angle. Just barely getting the bottom corner of the wood. They will look like the following…

Here is the 10 degree angle cut on both sides of each stave…

Next I use an elastic band to wrap around all of the staves… arrange them into the shape of the drum at this stage. Then I secure the whole bunch of staves with a hose clamp, as such… just on one end so it can be glued together…

Notice the kind of glue that I use! This glue washes off with water and is SUPER strong on wood. With one end loosely secured with a hose clamp you can open the other end and glue it up. You will need to spread an even coat that is not too thick. It is best to do it on both sides of each joint, but you will need to move fairly quickly.

Glue being applied…

I place another clamp over the open end once all the joints glued. Keep it fairly loose and flip the drum over and take off the other clamp. This will allow the staves to spread out while I finish gluing.

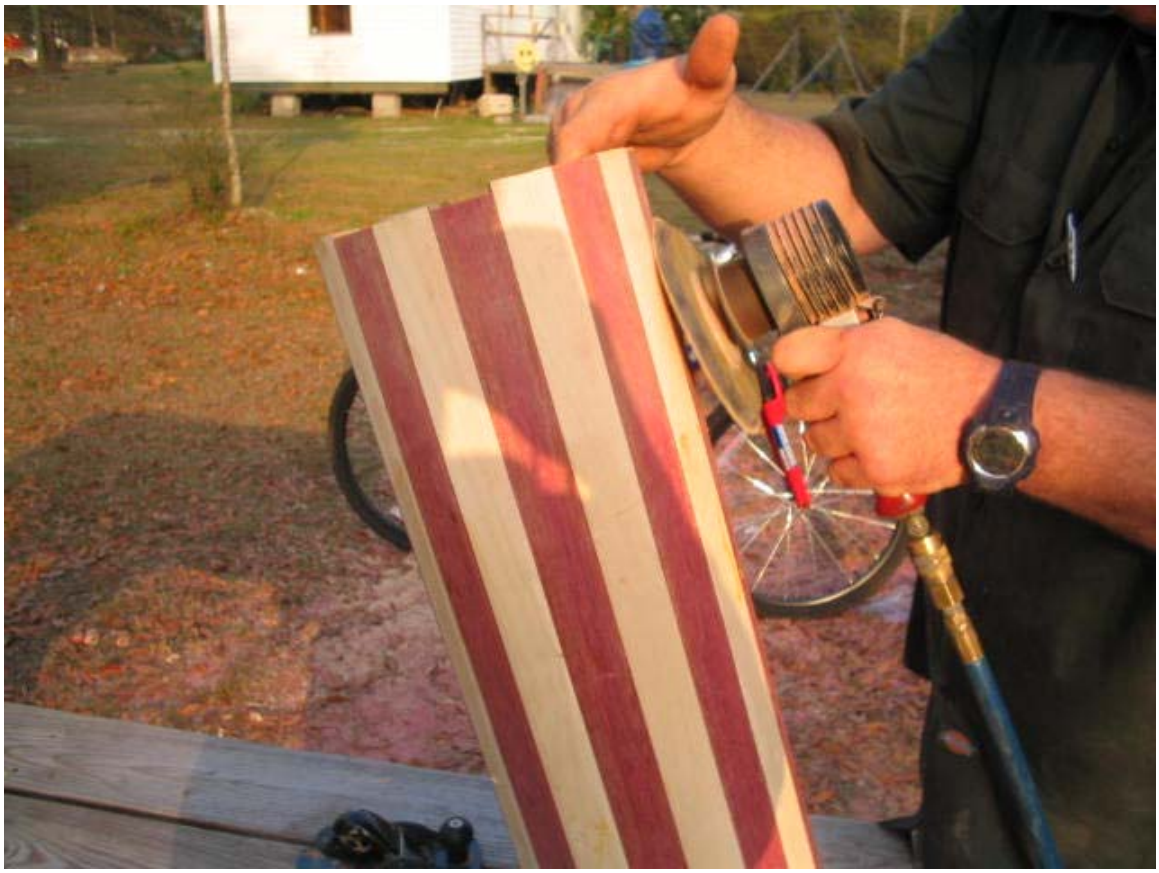
Here I am gluing the bottom end of the drum… this is a hands on matter! That is why I prefer this kind of glue. It washes off! Trust me on this matter… I have worn glue for days before I learned this.

Once finished evenly gluing all joints put the clamp back on and adjust all of the staves. Even them out top and bottom. The better that you do on this part the less sanding will be required, because the edges of each stave line up exactly with the next, creating a smoother curve. Not my car or house by the way… Those are the neighbors LOL

After adjusting the staves, attach two more hose clamps and tighten the drum evenly all around. Go over it tightening several times. Check that each joint has glue squeezing out a little. Use a wet cloth and clean out the excess glue from the inside of the drum. Make sure to spread it into any place where there may be slight gaps. Tighten it again. Check to be certain of the evenness again.

I am cleaning out the excess glue, and then I will leave it to cure overnight.

Once the glue is dried I use a hand plane to help remove the glue and begin to round off the corners of the joints. And then I use a pneumatic random orbital sander with very coarse grit sand paper…(I found a much more effective method for this! I discovered that using four-inch angle grinder with an aggressive sanding disc is PERFECT for this task)



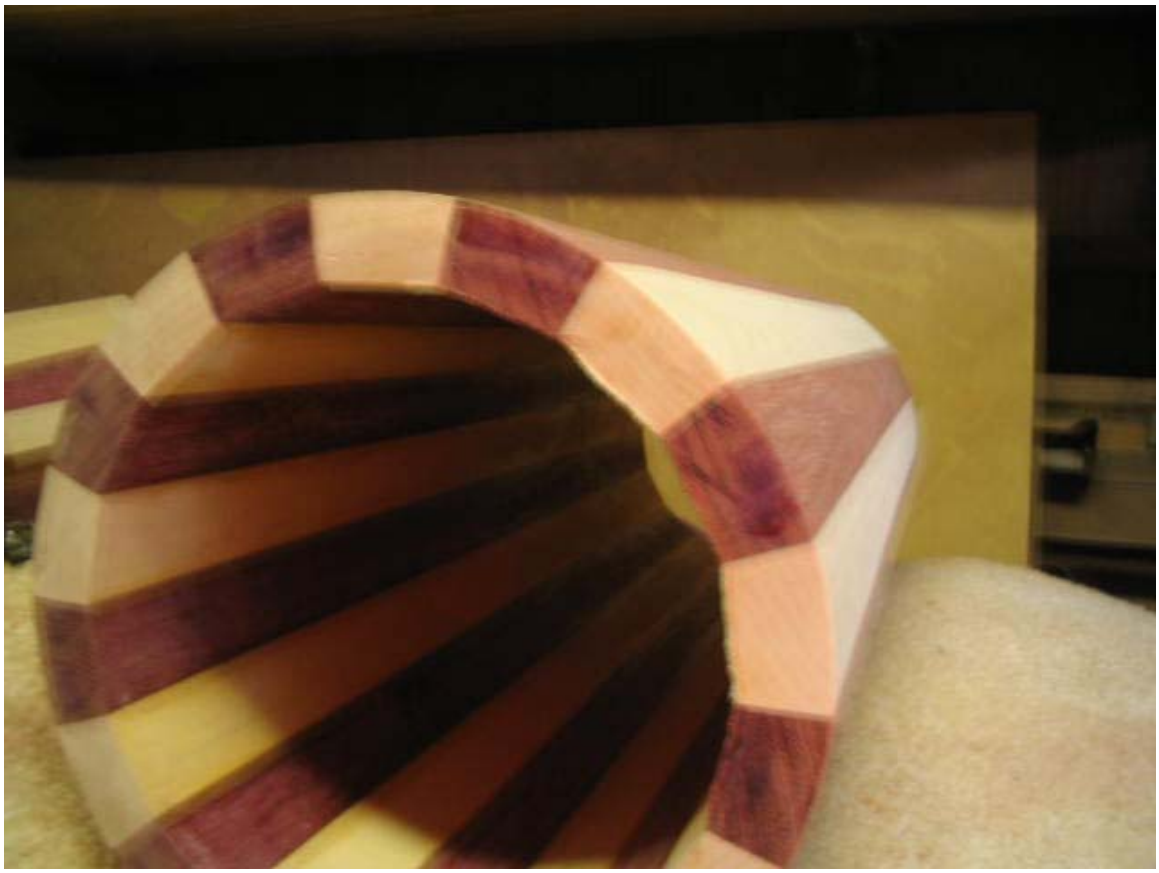
Here is how I do it. This is a long process. This is just the beginning of the sanding. This stage is all about shaping the drum. This is where all the roundness comes in. Not enough time on this step and you will see it a lot when you have varnished the shell. Take your time here. Smooth out any roughness of the wood… Notice that the end of the staves is not even… I don't stress perfection any place except the width of the staves and the angles. I will cut off the ends later to get a nice flat surface.

Here is the shell VERY rough sanded to 40-grit sandpaper. And wiped down with a wet rag to show the progress…. It is starting to look like something! (We are going all the way to at least 220 Grit)

Now I put a clamp back on to use as a marker to draw a line. I will use this line to cut off the ends of the shell to be at the finished length. I make this cut with a jigsaw. It leaves a nice clean semi flat edge.

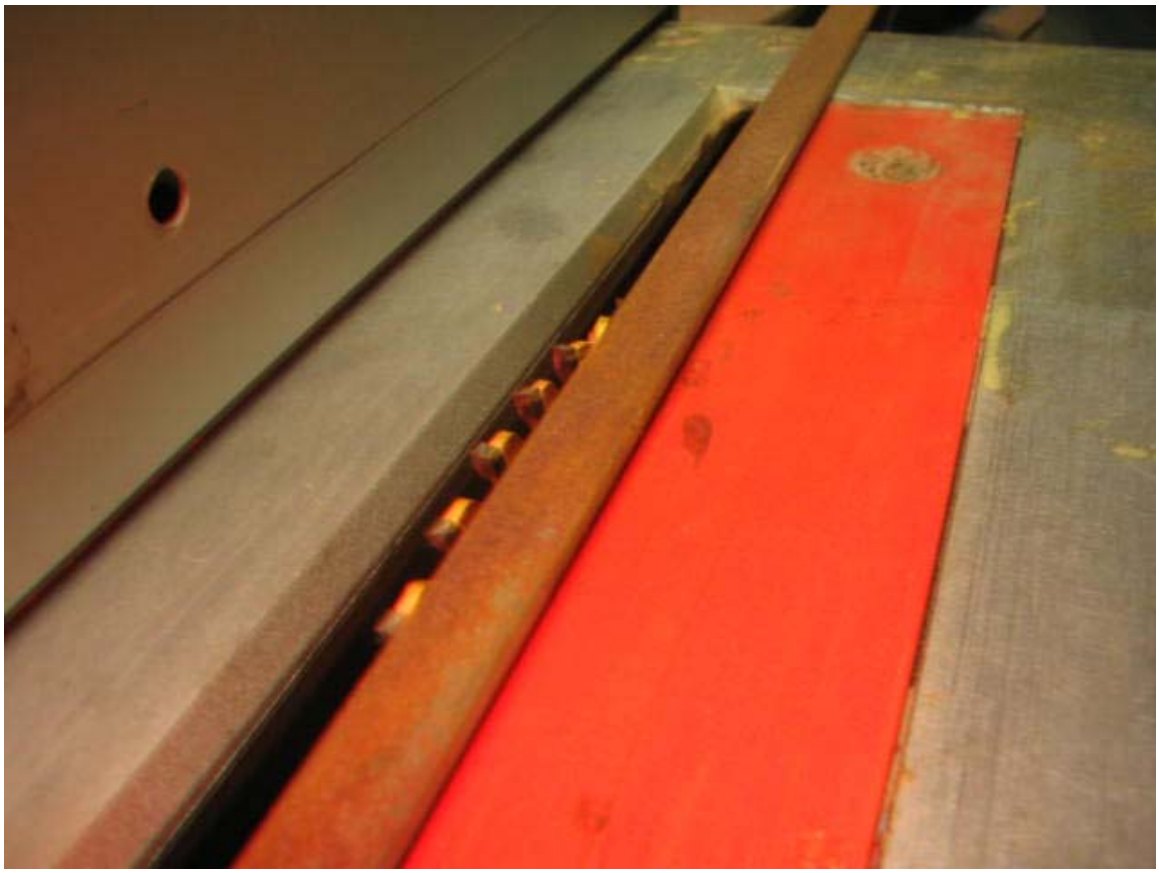
I know my workspace is a total disaster area! Once I have cut both edges flat, and have a level end, I finish that up by sanding that area as flat as I can get it, and as level as possible. (This picture seems a bit out of proportion do to trying to get a picture while holding the camera and the saw at the same time…)

I found that a 40 grit sanding disc on a 4” angle grinder make a very good tool for this! You have to be careful here because the grinder is a bit aggressive but in the rough stages I like aggressive. Sand the ends flat and then use the angle grinder to work more on the rough shaping of the shell. I found that this combo works VERY well on the hard purpleheart and smoothes down the facets of the joints quite nicely. Use very light pressure or it will chew off more than you want it to!



As you can see the shell is now very round. The angle grinder made very quick work of that task. As a matter of fact it does so well that I am going to skip using the hand plane in the future as a step to round the shell. The hand plane often digs too deeply and gouges the wood around odd grain patterns causing the need for even more sanding… so an angle grinder is the tool for shaping of the shell!

This picture shows how round I got it using that method. Notice the edge… nice and smooth.



Now I cut a groove around the bottom of the shell to accommodate the ring that the tensioning rods go through. Many folks make this ring of round stock. I like flat stock for this. I think it makes a smoother profile and looks nicer. The picture above shows the flat steel stock that I make this ring from. I set my table saw blade to the same thickness as the steel so that it fits at the correct depth like an inlay in the wood.

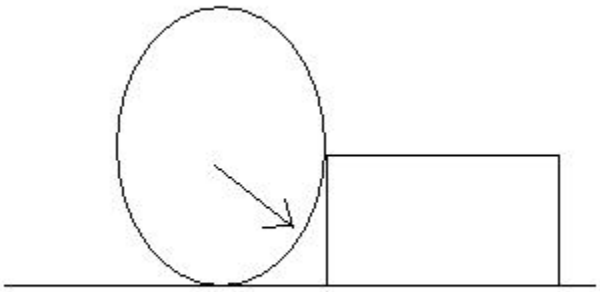
And then I set the rip fence to the width of the steel…
Then I begin cutting a groove by rotating the drum shell over the table saw blade.

Here is the beginning of the groove… now I set the rip fence a little closer and cut again. Each time setting it a bit closer…

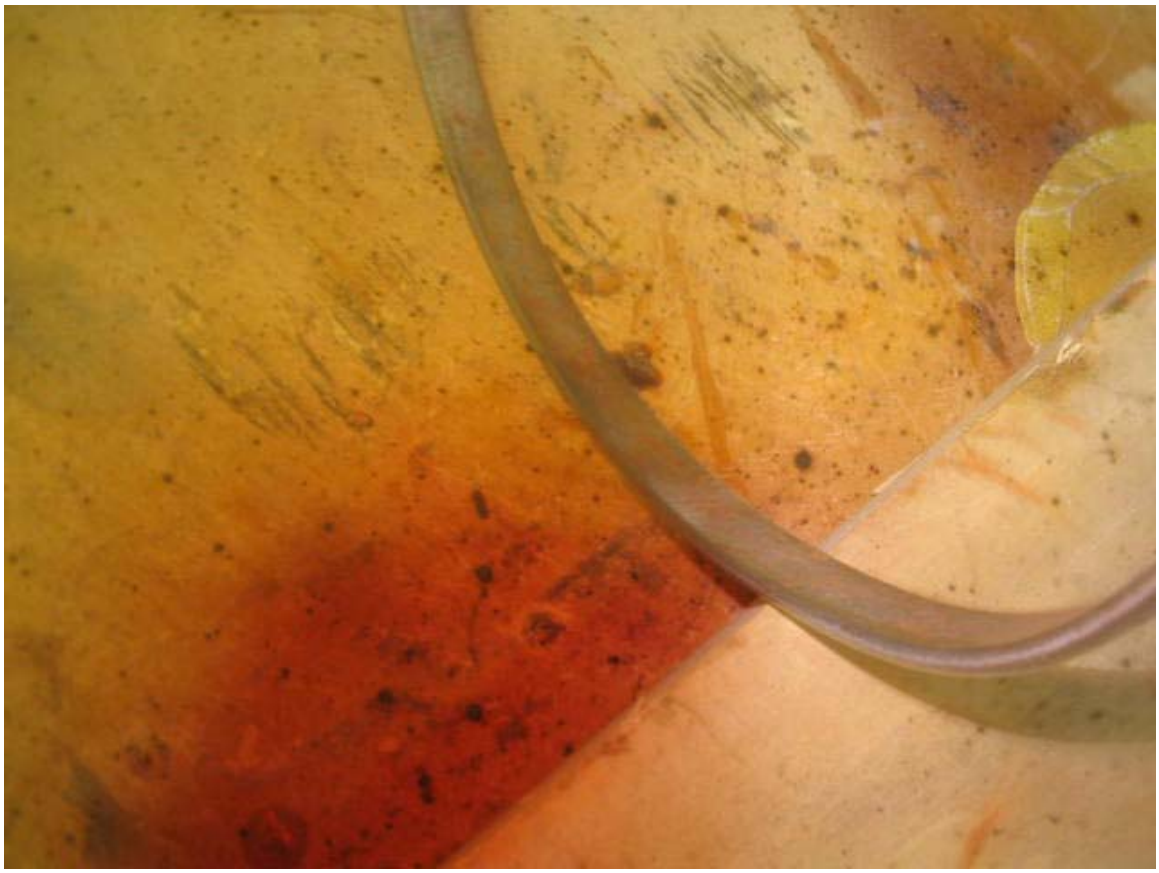
I continue doing this until I remove as much material as possible, and then using a chisel, I smooth out the groove…

When the groove is cut it is time to begin shaping the steel ring that the groove was made for… I use soft cold rolled steel that I can bend with my hands. I also use a hammer to shape the ring…

I use the groove it's self to bend the ring as much as I can but the ends will not go. I cut the excess off and begin to bring it into shape with a hammer. I then lay the ring against a large block of wood and hit the steel with the hammer in the area that lies between the corner of the block of wood and the table. I do this working all of the way around. This takes out all of the flat spots and starts creating the roundness…



Hammer in the location of the arrow. This will round out the flat spots and create the round shape needed. Continue over the entire ring. The more you do here the better the shape with be in the end. Go back over it again once welded.



In the area that is red on this picture is where I hit with the hammer. Small strikes to create tiny bends that add up to being a rounded ring…

You can see here that the ring is beginning to fit nicely but the ends still are not touching. Notice that there is still slack and gaps. By careful shaping these gaps will be removed and the ends will touch so that they can be welded closed…

Finished ring shape… now the welding, and grinding…

Now the ring has been welded closed but it does not fit exactly. If you have cut the ring the right length and it is as round as you can get it, it will fit. No matter how round you can get it using these primitive means, the ring is bound to be a bit oblong and oval shaped… that is ok! The drum shell will be a bit oblong and oval shaped too! You just have to rotate the ring around the shell to find where they match up. This needs to be tight, but not so tight that it is damaging the wood. It must be tight enough so that it cannot rattle when the drum is played. But it must be loose enough to get it on and off…. This will take some practice. Most of the time I get it very close the first time, but sometimes adjustments need to be made…

Here is a bit of a blurry picture but you can see that the ring is fitted to the shell in the manner described above … now I need something for the tensioning rods to pass through on this ring… I have used small pipes cut to the right size and welded on but now I prefer something called coupling nuts. They are threaded but that is no big deal, because I get a size larger than the size of the tensioning rod and I drill the threads out…Here is what they look like…

Sorry for the blurry pictures, it is plain to see that I am no photographer!!!!!

I use a c-clamp to hold the coupling nuts in place on the ring while I weld them, at opposite sides from each other. This is another place that takes practice… you want the finished drum to have tensioning rods that are straight. Try to use the stave joints as a guide. You want them to line up when all is finished…

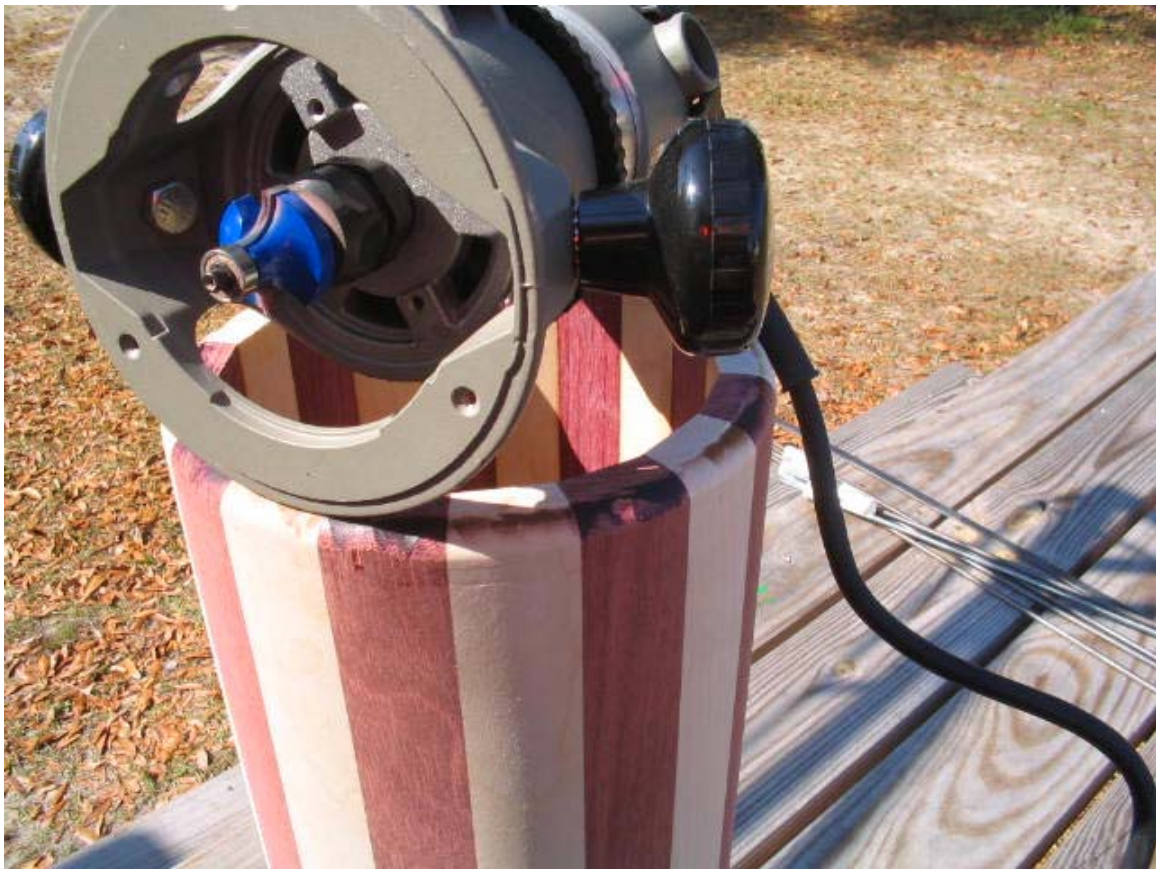
Here is the welding of the Nuts on to the ring…

These pictures look like I made a dub version of this tutorial…

Now I have welded all the nuts onto the ring and ground all the excess welds down this part is ready to coat with paint…

This is a test fitting of the bottom ring.

The next step is to round the bearing edge of the drum so there is a nice rounded corner for the drumhead to rest against. This also makes drumming more comfortable on the hands. I do this with a 3/8” round over bit in my router. If you don’t a router you can do this with a Sander and a lot of work… here is the result.



Notice that the router has burned the wood a bit. This, along with any rough places that the process created, will need to be sanded off. Now I route the inside edge of the bottom of the drum. This is purely for the sake of beauty. It serves no functional purpose, but I think it makes the drum look professionally made.

Here is what that looks like…

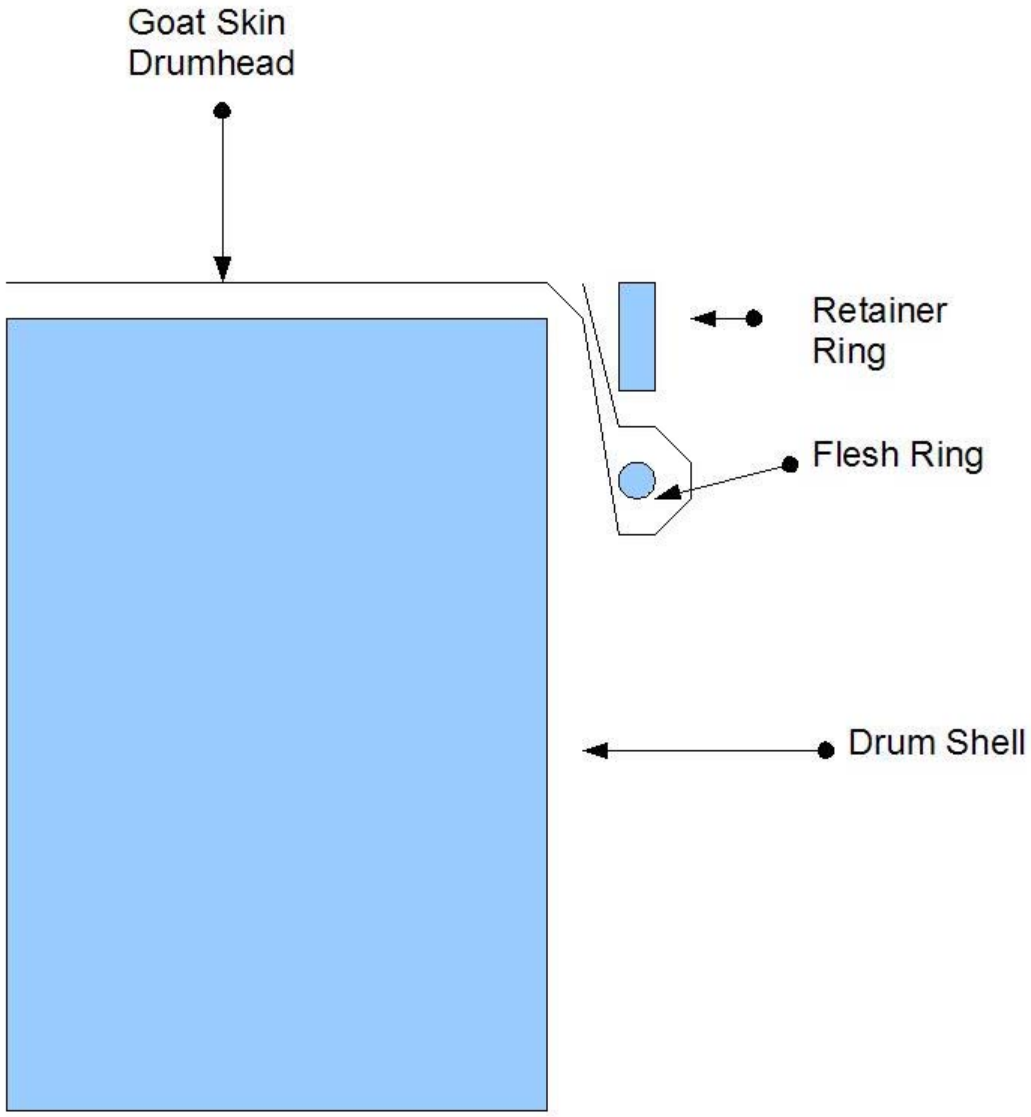
Again, any burn marks will need to be sanded down, and the edge will need to be sanded smooth.

This is the flesh ring that goes around the top of the drum and serves the purpose of locking the drumhead in place. I show it here because this is my last chance to use the groove on the bottom of the drum to help me shape the metal. I use ¼" cold rolled steel for this and the tensioning rods. This is fairly easy to bend and manipulate into shape. I made this curve this far by bending it around the bottom groove on the Drum shell… This ring needs to be about ¼" bigger than the outer width of the drum shell. It must be able to move freely.

Notice how it matches the curve of the shell with out touching. Bending around the bottom groove did this. Again that was the last chance for this, because now I am going to be sanding the drum for finishing. I use the pneumatic sander to 180 grit. This creates a very silky smooth finish. The wood grain begins to “glow” and become translucent in a way at this stage. When I have it sanded to 180, I use 220 grit and block sand the shell with the direction of the wood grain. This removes any swirl marks left by the pneumatic sander, and really polishes the wood. It will begin to shine now. I use the compressed air to blow the dust out of the wood grain and out of the inside of the shell and wipe the whole shell down with acetone, lacquer thinner, or something similar. I do this to remove any dust left from sanding and any oils left from the skin on my hands. Now it is ready to coat with wood finish. I use spray polyurethane. It will dry to a hard, shiny, glossy finish. There are a bunch of other things that you can use for this, but keep durability in mind. You can rub in a finishing oil like boiled linseed oil, or gun oil, or such. You can use a lacquer. You can even paint the shell if you are using a wood that is not to be the focus. Here is the first coat of poly…

Notice the color change on the purpleheart. It will begin turning more and more purple as it is exposed to light and the resins in wood begin to oxidize.

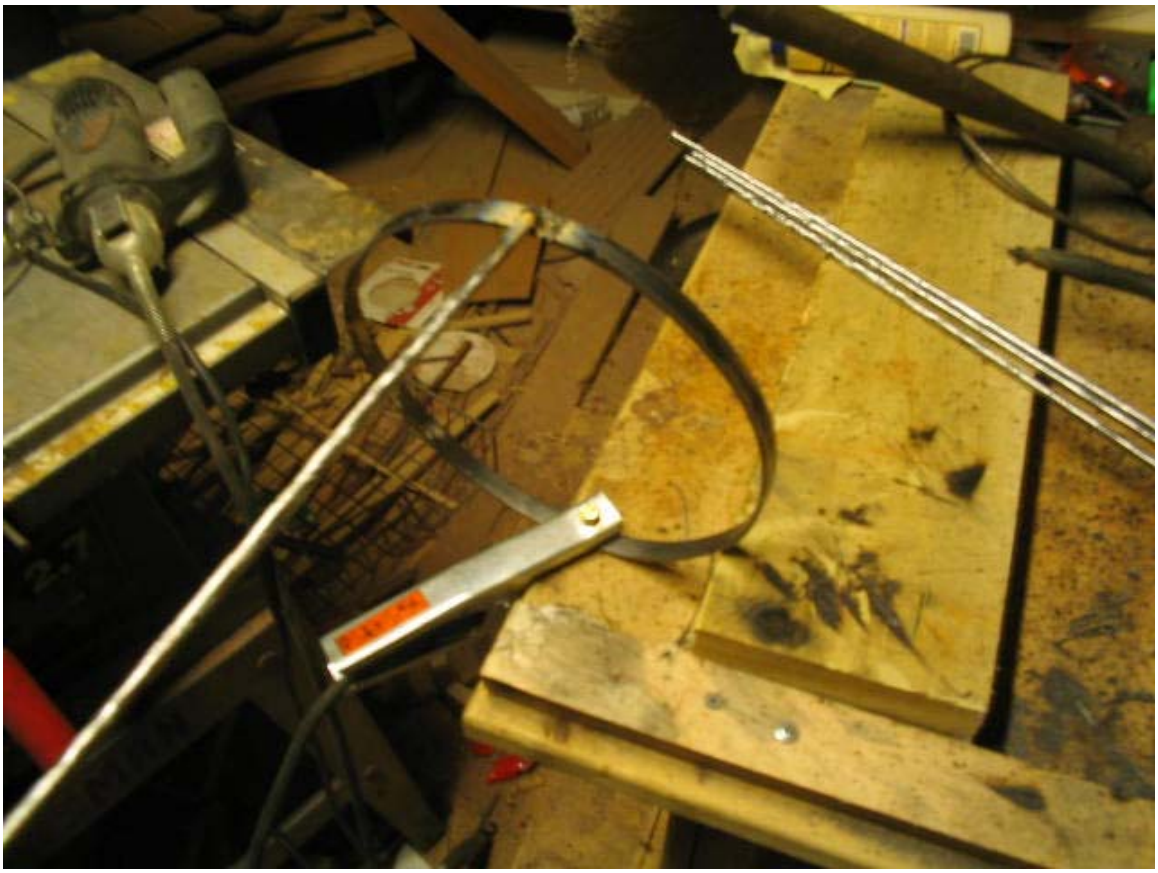
This is a picture of the flesh ring and the retaining ring. The retaining ring is the flat stock ring on top. The retaining ring is going to have the tensioning rods welded to it. It is VERY important that the flesh ring be the same size or even slightly larger than the retaining ring. Here is a crude drawing of how this works…



Notice that the skin wraps around the shell, and under the flesh ring, and back under the retaining ring. Now when the retaining ring is pulled down by the tensioning rods it locks the skin on to the flesh ring. This is why it is important that the flesh ring is the same size or a slight bit larger than the retaining ring. If it were smaller the skin would slip right through…

This is the material that the tensioning rods are made from. On the left is a material called all thread. It is basically a threaded rod. I am going to cut this into pieces about 7-8" long, and weld the pieces to the ends of the rods to the right. Those rods are ¼" cold rolled steel. You can buy all of these materials from a home improvement store, such as Home Depot here in the U.S. If you have a steel distributor in your area then you can save a considerable amount of money buying from them. In my area I can buy a 20' long section of this for $8 verses $2.87 for a 36" section from Home Depot. That is the way to go if it is available to you.

I have now welded the threaded rod to the ends of the tensioning rods… those are on the right in this picture… (Another way to do this is to cut the threads on the rods your self instead of using the all thread rod. The tool to cut them is fairly inexpensive, but it is hard work and very time consuming. If you can, welding all thread on is the way to go.) In this step I am going to weld the tensioning rods on to the retaining ring. It is extremely important to line up the rods with the coupling nuts so I am marking the retaining ring in line with the nuts so that I know where to weld the rods…This is VITAL to a nice looking drum!



Here is the first rod welded to the retaining ring. I have welded the rod slightly below the edge of the ring. I do this so that I can weld a transition there. This makes for more comfort on the hands and it leaves it very smooth. Remember to clean up your welds. Smooth out the metal as much as possible. Note… a lot of folks use round steel for the retaining ring. You can if you like. It is matter of preference. I like it this way…

Here are all four rods welded in place and the metal is sanded smooth and “polished up”. While I am doing all of the welding, I am also applying 5-6 coats of polyurethane to the shell. Go by the instructions on the product that you choose…you will do much better in the long run!

Here I am trying out the fit of the tensioning rods on the bottom ring. If you want, drill out the threads on the bottom ring to make for easier assembly. Look to make sure that the rods are not angled as much as possible here. Now is when it can be fixed.

This is also time to check the sizing of the flesh ring. With the tensioning rods in place you will likely find that the ring will not fit well. Remember that the rings are slightly oblong. Turn it inside the rods to see if there is a place that it will fit nicely. If not, now is the time to correct it. It must go down flat against the retaining ring.

This is the time to paint the metal parts of the drum. If you can, powder coating is extremely nice. I have done this in the past and it makes a very professional looking drum. I didn't have this option available for this tutorial, so we will be painting the parts with black paint. I prefer a paint that leaves a shiny "hammered" looking finish. The texture hides some of the imperfections a little.

After this we start working with the goatskin.

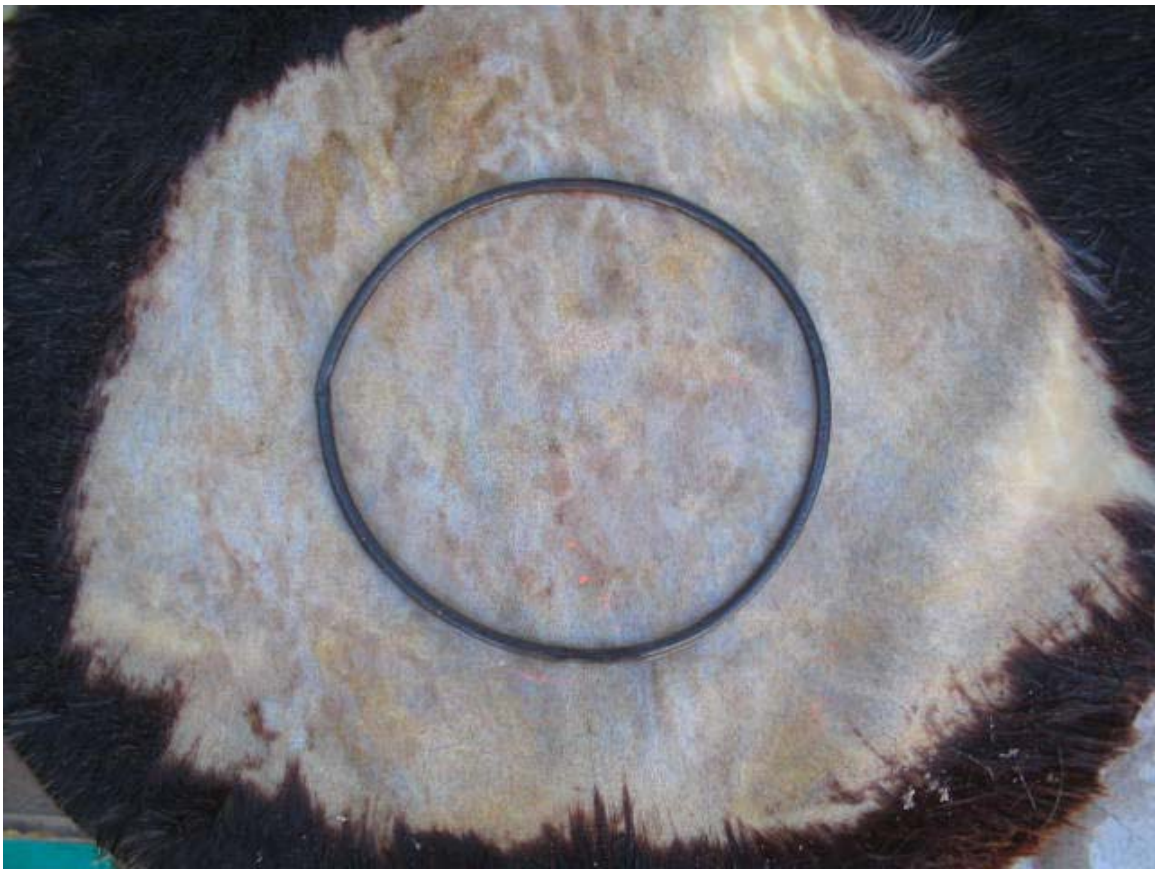
When the goatskin comes it is dried and stiff. In order to get it ready to mount it needs to be soaked and shaved. I soak them for several hours in water. I have recently started adding bleach to help sanitize it a bit. When you get a hairy goatskin is has a funky smell. LOL It smells like a goat! What else would you expect? After it has soaked I wash it a bit to remove any sand or dirt from hair… I have received them in various states of cleanness.

After the soaking and washing it is now time to shave the goatskin. Much stress and concern is made over this step, but in truth it is fairly simple. The shaving of the hide

can be done before or after mounting the drumhead. I prefer before, because I do not like to leave the hair on the drum. I have seen Kete drums made this way but most are not. Most Djembe drums are made with the hair still on. Not my style! But if you want to it is still simple. Just put these steps in a different order.

To shave the skin I prepare 4-5 Bic razors by breaking off the blade guard with pliers and I sand the corners, so that there are no harsh points that could gouge the hide. Then I lay the hide across a very flat surface. It cannot have bumps underneath because these may cause you to accidentally cut the hide and ruin it for the purpose of a drumhead. It must be as flat as possible. Skins for drums are too hard to come by to be wasted, so carefully clear the area underneath.

Then with smooth strokes with the handle parallel with the hide begin to cut through hair down to the skin. Once there, you be amazed at how smoothly the hair comes off. I use the Flesh ring as a guide for how much I need to shave. I leave about 6 inches or shaved hide around the outside of the ring as such…



I shaved this much area in about 5-10 minutes. Now this doesn't leave the hide perfectly cleanly shaved. The hair roots are still there and will need to be dealt with later after the skin has dried on the drum. Now with scissors I cut the hide into a rough circle remembering to leave plenty of extra room…

Now while the skin is still very pliable and soft and wet it is time to begin mounting the drumhead. First I remount the bottom ring, finding the best place around the shell that fits best. Now I realign the bottom ring with the retaining ring and tensioning rods. We want them as straight as possible because if they are off, the effect seems to be magnified when set against the straight joints of the staves. Here is how this looks…

From here I keep each part in the same alignment. Keep all of the parts oriented so that everything lines up nicely. This is also done to flesh ring to find the place that everything is cleanly aligned.

I then wrap the skin around the flesh ring place it inside the retaining ring with the hair side down. (This very important!) You want the hair side facing out. I place the skin and flesh ring inside of the retaining ring between the tensioning rods like this…

Tuck the edges of the skin through the inside of the retaining ring. If you get this too tight the ring will rest too high and will not be comfortable on your hands while playing. I poke the center down to push a nice hollow space like a pocket. This part may take some practice. Remember that you can readjust things while the skin is wet and pliable and the drum has not been tightened much. Keeping the same alignment as before lower the shell into the center of the retaining ring. It should be able to touch the working surface with a little slack for the proper fit. Doing this may require some help because you will not want the tensioning rods to scratch the drum shell, and it will take some help inserting the tensioning rods into the coupling nuts on the bottom ring. All of the rods have to go into the coupling nuts at the same time and it must be evenly so that they do not bind.

Once in the coupling nuts the rods should just barely come out on the bottom. This allows for the most freedom to tighten and tune the drum when finished.

Now thread on some nuts. We will use them to adjust and tighten and tune the drum to it proper tone.

For the first bit of tightening I keep the drum upside down. I do this so I can adjust the rings as it pulls together. Be very diligent about keeping the drum shell centered in the rings. Keep the flesh ring centered in the retaining ring. If you do not do so the retaining ring may not “bite” into the hide well enough. By tightening evenly you should be able to keep everything lined up and you will begin to feel the tension on the nuts increase slightly as the tightening of the nuts starts pulling on the drumhead.

After it gets fairly tight you can move it with out things shifting.

Then I flip the drum over and stand it up on the tensioning rods, which have now become legs. The top will now look like this…

Notice that there is about an inch of hide below the bearing edge of the drum shell. This allows the Rings to be low enough that you are not hitting your hands on them when playing. That is much more comfortable then having a smaller gap there. If there is much more things seem to get a bit out of proportion. While I have it in this stage, I tighten the nuts little by little, in an even manner. Watch the retaining ring. You will want it to be as level as possible so tighten accordingly. If one side is too high, tighten the nuts on that side a bit more than the other. By doing so you can maintain a good level to the rings, which makes the drum more professionally done. Also it keeps the pressure on the drumhead even and that leads to better tone. I keep tightening until I get a low toned “Bong” kind of sound. Once there, allow the hide to dry for several hours, or over night.

When the skin has dried thoroughly, it is time to tune the drum. Start tightening the nuts evenly all around the drum. As it gets tighter the sound when tapped will go from a low bong to a cleaner, tighter sound. Be very careful to watch the retaining ring and be sure that the drumhead is not slipping. Tighten the head until you get the sound that you are looking for. On the Kete drum it should have nice and metallic sounds around the edges, with deeper richer tones in the center. These drums should be a bit deeper in sound than the larger side of a bongo drum. It should be higher and more of a lead instrument than a conga. Snappy, and clanging sounds are both quite with in the range of the Kete.

Now that I have the drum tighten and tuned and I am sure that there is no slippage in the drumhead, I trim off the excess hide that is above the retaining ring, leaving a nice an neat edge. Now you will notice that there is a slight bit of hair stubble that has shown up since shaving the hide. This is easily taken care of with some 220-grit sandpaper. It will remove the hair and it also removes any layers of skin that need to come off. Be careful not to over do it! You don't want to sand through the drumhead, my only purpose is to smooth things out a bit. Now check the tuning over the next several days as the skin may still stretch a bit more. It will eventually stabilize, and not require tuning often. When it does it will be small ¼ turns on the nuts to get it back into shape…

Well, here we are! Finally! A finished drum. Enjoy!

Well, now that this drum is finished, it is time to get down to making some music! This thing will sound great on tons of different styles, but this thing has roots in Nyabinghi Culture, so Reggae comes natural! Go out and spread some conscious vibes and love. Bless others with music. Bless them with a drum! You know how it is done now!

If you would like to find some great Nyabinghi Drumming, Ras Michael is classic. Check out his site.

http://www.rasmichael.com/

Check out some sound samples here…
http://www.amazon.com/exec/obidos/redirect?link_code=ur2&tag=thedubroom&camp=1789&creative=9325&path=tg%2Fstores%2Fartist%2Fglance%2F-%2F40330

Blessins and One Love!

If you have any questions that I may be able to answer, by all means email me and I will try to help.

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