

Deejay's Adventures of a First Time Drum Builder

(Or how to build a snare drum)

Introduction

I'm pretty much the epitome of a DIYer... AND I'm an obsessive-compulsive data junkie. When I set my sites on something I have to research everything I can on the subject - *almost* to the exclusion of all else!

About few years back I bought my 11-year-old nephew a beginners drum kit and fell in love with drums! I had to get my own kit.

A while back I found this website site called DrumRap.com. They have all kinds of helpful hints on how you can build your own snare drum. And it sounds pretty simple. They talk about all kinds of drum shells 10 ply, 20 ply, 30 ply, Stave Shells, Segment Shells - I wish I could hear the differences in each shell, but locally my choices are limited to metal and 10ply 14-inch snares. So I am wondering how I could get one of each to try them out.

When I need ideas I sometimes checkout eBay. So I scan eBay for a drum shells. I find a 12 x 12 inch Birdseye maple 10 ply shell. Hmm, I can cut it up into one 10 ply and one 20 ply shell and its only \$30 with shipping.

Next I find a 13x5 mahogany stave shell made by JTPCo for \$59. Between the two that'll get me a 10 ply, 20 ply and a stave shell to experiment with.

And the Adventure begins ...



12 x 12 10-ply Birdseye Maple shell



5 x 13 Mahogany stave shell

Initial Sanding

The first step I used was to sand the shells to finishing quality inside and out. Sand down to a 350 to 400-grit paper and polish off with a good tack cloth.

Next I lightly stained the maple shell with MinWax Honey Maple gel stain. It doesn't change the color that much but brings life to the wood grain. Let it dry for a day and rub down well with a dry Scotch Bright pad, more commonly known as the "greenie pad". This gets rid of the little fuzzies that come up on the wood when it was moistened by the stain.

For the mahogany shell I didn't stain I just wiped it down with a damp cloth, let it dry and rubbed it down with a dry greenie pad to remove the fuzzies.

Then I add one light coat of Formby's Low Gloss Tung Oil finish to the wood inside and out before handling. This helps protect the wood from scratches or stains while your working with it or from those dirty, oil sticky little fingers that always find their way down to the workshop (sometimes even from adults). This will be the only coating on the inside.

Initial Protective Tung Oil Coat

I always try put one thin protective coat of tung oil on all finished sides of the wood I'm working on to prevent any contamination to the wood by curious dirty, sticky or oily fingers. This also helps when wiping off glue squeeze out before finishing.

I like Formby's Low Gloss Tung Oil for finishing wood. I've tried varnishes and shellacs (flaked to premixed) for finishing wood and I always go back to Formby's. Why? It's almost fool proof, resists cracking and checking with extreme temperature and humidity changes and it's easy to clean up after. I don't normally use Polyurethane finishes, although I may experiment with it on my next project - a mahogany veneer ply shell made my hand.

A note about "low" and "high" gloss Formby's. I have used both simply because I thought there was a big difference. Now I only buy the low gloss

because I find I can get a high gloss finish buy adding a few extra coats of low gloss finish if I want it but you can't get a good low gloss finish from the high gloss product. I'm more of a low gloss high polish kind of girl anyway.

Cutting The Shells

Next step is to cut the 12 x 12 into 3 equal pieces using a good plywood blade. (Note I didn't think to photograph this until the first section was already removed).



Cutting the 12 x 12 10 PLY into three pieces

Once cut I measured the inside of the shell very carefully using a metric tailors tape purchased at my local Wal-Mart from sewing or craft center, I cut out a small vertical slice corresponding to that measurement and could now insert one shell into the other.

Don't forget the inside diameter of the first shell is now the outside diameter of the one you will cut to fit inside the first shell to obtain the 20 ply shell. It will probably be bigger than you expect.

Once cut I placed the smaller shell inside the bigger shell to check for fit. It's a bit tight going in but once set it fits perfectly! I removed the inner shell brushed glue (I like Tite Bond or Elmers wood glues) all around the inner and outer portions of the shell (where contact is made) compressed the inner shell and inserted it into the outer shell. With a bit of wiggling I got the seams to meet and wiped off the squeezed out glue with a wet rag. I then placed spring clamps all around the shells to hold it in while drying.

I now have a 10-ply shell and a 20-ply shell for only \$30 instead of a \$150! I can handle that.

Cutting the Bearing Edges

Next I cut the bearing edges with an old \$15 router/jigsaw table, a 45° chamfer bit with guide bearing and wheel guides made of some heavy-duty spring clamps and furniture rollers to help hold it in place (I am working with a broken ring and pinky finger on my left hand right now).



Old router table and jig



10 ply inside edges



10 ply outside edges

Here's what the edges looked like after cutting them with my router table jig.



10 ply edges



20 ply edges



Mahogany edges

Finishing the shells

My basement is very damp (no heat down there and this is New England) so I don't do any finishing down there. I used to do it in the attic room but that now houses my kit ... Hmmm clean dry room to hang my shells to dry? The kitchen! Guys don't try this at home your wives will probably kill you but this is my kitchen and it only gets used once a day except for coffee so ... LOL

I made a little jig to hang my shells off my cabinet door pulls using two "S" hooks and plastic coated bent coat hangers (just make sure the hangers

don't touch the finish). It works well for me and I think it looks rather nice don't you?

First real coat of Tung Oil



After 24 hours I lightly wet sanded using a 400 grit paper and oiled again.



10 ply



20 ply



Mahogany

After about 4 coats you really start to see the depth developing. You'll also be able to use finer sandpaper. After 4 coats of Tung Oil you should have all the open pores in the wood sealed. Now you can switch to a 600 - 800 grit sand paper between coats and progress up to 1000, 2000, 3000 grit as you go. Remember to wet sand the finish with a drop

After about 14 layers of Tung Oil I decided I was happy with the finish so it's time to start finishing.

Buffing and Polishing

Some people do this step last I like to do it before I drill.

For this step I recommend using an electric polisher - the type you would use to wax your car. You could also use a drill with fitted with a sanding attachment if you don't have an electric polisher.

Compounding

The first thing I did was buff it with plain old fashion car compounding paste. This will make the finish look hazy so don't panic! Apply the paste lightly in small circles as you go around the shell. Let it dry completely and wipe it off by hand. Do this 2 or 3 times depending on the affect your going for. If you want a low gloss shine once may be enough - for high gloss do it 2 to 3 times. It also depends on how good your sanding technique was. This is step like microscopically fine sanding. It cannot make up for your lack of good sanding in the prior steps.

Be sure to change or wash your hood between applications - you don't want old dry paste particles to scratch your drum shell!

Step by Step Compounding Process (5 steps):

- 1) Apply the compounding paste using a fabric hood on your polisher or soft towel hood. Let it dry.
- 2) Remove the dry compounding paste using a soft cotton cloth - do this by hand turning or changing the cloth frequently to avoid scratches from old dry paste on the rag.
- 3) Once the dried paste is completely removed buff it using a lambs wool hood.
- 4) Evaluate the shell - Is it smooth enough? Is it evenly polished no shinny spots? You may decide you really need a few more layers or sanding and finishing at this point - all your imperfections will show. This is the last chance you have to change it! If your not happy with it go back and fix it before you wax!
- 5) Repeat 1 - 4 as needed

Waxing

Using a soft towel double thickness or polishing hood apply a small dollop of paste wax to the damp polishing cloth on the wheel and using small circular strokes work it into the shell and let it dry.

Once it's dry wipe it off with a clean dry soft cloth. Turn or change the cloth often so you don't scratch your finish.

Do this a few times and then buff it all with a lamb's wool hood.

Step-by-Step Waxing Process

- 1) To apply the wax use a piece of double thick soft towel.
- 2) To remove the wax use a soft cotton cloth - do this by hand turning or changing the cloth frequently to avoid scratches from old dry paste on the rag.
- 3) Once the dried paste is completely removed buff it using a lambs wool hood.
- 4) Repeat steps 1 - 3 as needed.

Marking for Hardware

For me drilling is the worst part! I always think to myself ... All this work and one slip and it's ruined. Anything else up to this point can be fixed but a badly placed hole or drill breakout the piece is now garbage! Don't let that scare you - I did say I was obsessive compulsive on page 1 didn't I?

Everyone seems to have a different way to lay out the shell for lugs this is my way. I suggest you search DrumRap.com for alternative methods and see what suits you before doing it. That said ...

Run a piece of painter's masking tape all the way around the top and bottom circumference of drum. Make sure it covers at least 1 inch of the shell.

Lay your hoops on a flat table - set a drum head inside of it then the shell inside of that. Next place the second head on top of the shell and the last hoop on that. It should look like a finished drum minus the lugs.

Look carefully at the shell. Try to place the lugs and snare hardware where you find small imperfections in the wood. You want the prettiest part of the wood exposed not hidden by hardware. The strainer (snare throw-off) can be used to hide a not so good-looking wood blemish or even the line where the plys come together.

Line up the rims so the tension rod holes are directly above one another. An easy way to do this is to thread a piece of string through opposite holes and hold them in place by placing loops over your tension rods or other small thin objects on both ends - this allows them to self center themselves and holds everything tightly in place.

Next tear one strip of masking tape almost the height of the shell for each lug you will need to drill and place it from hole to hole. This is where you will do your marking for the drill holes for your lugs.

Next grab your strainer. Set it about 1/4 " or 6.35 mm above the bottom drum head ring (give it a little room to move) directly between two lugs spaces. Don't forget to place it in the least attractive spot on the shell. Place a piece of tape where you want to place it and draw lines around the mounting plate for a placement guide. If you can mark the holes do it now. I highly recommend you use metric measuring tools because all lugs are metric and it's more precise!

Now grab you butt plate. This needs to go exactly opposite the snare throw off again about 1/4 " or 6.35 mm above the drum head ring. Add masking tape where it should go and mark the holes with a pencil now.

Draw a line around the top edge of both drumhead rings. Draw straight lines between the tension rod holes using a small straight edge and the string as a guide. Measure the distance between both drum head rings carefully. I used calipers but you could use a tailor's tape marked in millimeters (about \$2 at Wal-Mart) as well. Mark a dot exactly half way down each piece of lug placement tape. Find a space between two lugs half way between your

strainer and butt plate and mark for the placement of your vent grommet (little eyelet hole).

Take all the parts off the shell and mark for the placement of your lugs. Using the center point we marked on the tape as your guide measure from center to center of the lug screw holes. Divide this number by two and measure that distance from the center mark on the tape. Place the lug on the marks to check your measurements.

Ready Set Drill

Now that we have all the holes laid out on the masking tape and before we actually drill the holes I suggest you place two layers of masking tape on the inside of the shell on the places you will be drilling. That helps to prevent the drill from tearing out or splintering the wood as it passes through to the other side. I like to also add a scrap piece of wood with a clamp to the back for extra protection. Remember to drill slowly!

Drill a hole in a scrap piece of material first and make sure it's the right fit. I found that the lugs were one size, the strainer another, the butt plate another and of course the vent grommet still another. Most were metric sizes!

I didn't have anything to hold the shell for me while I drilled it so I found a cardboard box a bit over sized and stuffed it with bubble wrap to hold it tight. It worked pretty good.

Before you drill use a prick punch or take a small nail or pointed screw and tap it into the mark for the hole so your drill will be exactly where you want it. Then measure the prick marks to make sure you measured correctly. If your measurement is still right on you may begin to drill.

After you've drilled all the holes and you begin to fit the screws in and mount the lugs you may find the precision of the lugs are not that great. Some times one lug will fit just right but another one won't fit perfectly. Minor adjustments can be made at the end. For very minor adjustments you can try running the drill in the hole again applying slight pressure toward the

end that needs to be widened to accept the lug. If more than a minor adjustment needs to be made try using a jeweler's file, or reamer.

Change you drill bit as needed and drill for the strainer, butt plate and vent grommet. Always use a prick punch on the holes and measure before drilling.

Once everything is drilled and everything fits as it is supposed to. Clean everything off and you may apply one more coat of wax if you want before putting it all together.

Assembly Tips

Okay the hardest part is done. We dry fitted all the pieces so we know it fits so all we have left is to put it all together!

Here is another place where some people may differ in beliefs. I never used metal-to-metal fastening hardware without first applying a drop of oil. I like to use trumpet valve oil for this purpose. It's about \$3 at your local music store. It is a very very fine machine oil. Much thinner than say '3 in 1 oil' or 'WD-40' types of all-purpose household oils. It also has a tip like an eyedropper or nasal spray bottle that allows for very minuet distributions of oil. It doesn't feel oily and it's not sticky, so a dampened soft cloth in a zip lock bag goes great in you tool box for wiping down your tools - like drill bits and saw blades after using them.

Don't squeeze the bottle just turn it up-side down and run it over the length of the screw and tension rod just before inserting them into their respective holes. It will leave just enough oil to keep it from rusting and lubricate the threads to keep them free to move as they were designed to do. It looks like water - you can barely see it on the thread if you applied it properly. If you used too much just wipe it off with a paper towel.

Do not apply too much torque on any of the screws or lugs you could strip them - just tighten don't crank it down!

Use washers in front of all screw heads and tension rods! Match washers to your hardware. Gold lugs, tension rods, strainers and butt plates need gold

washers - Silver lugs, tension rods, strainers and butt plates need silver washers - Black lugs, tension rods, strainers and butt plates need black washers. The exception is when you use nylon washers; they only come in white and black right now.

SO put on your lugs, strainers and butt plates, put in your vent grommet add your drum heads (don't forget the batter goes on top and the resonant head goes on bottom close to the strainer and butt plate.

Find the hoop with the little slots cut out put it on bottom with the resonant head and line up your hoops so that the little slots for the snares wires line up with the strainer and butt plate. Find the hoop without the slots and put it on top with the batter head. Thread in you tension rods and washers finger tight. Tune according to your personal taste. Add the snare wires and your done!

The completed projects

I apologize for the pictures they really do no justice to the drums but I could not seem to capture the depth of the finish with my cheap little camera but you get the idea.



Birdseye Maple Shell



Mahogany Stave Shell

Have Fun with your new snare drum!

Tools I Used in Drum Building

Sand Paper:

300 - 400 grit

600 grit

800 grit

1000 grit wet/dry sand paper (the kind used for cars)

2000 grit wet/dry sand paper (the kind used for cars)

3000 grit wet/dry sand paper (the kind used for cars)

Sanding Block (sponge type preferred)

Router - with 45° bit (to cut bearing edges)

Router table 2 Coaster wheels and 2 heavy spring clamps (to make router jig)

Table Saw (for cutting down larger shells if you buy shells pre-made you don't need one)

Palm Sander (nice but not necessary for pre-made Keller shells)

Drill (2 or more drill bits - depend on lugs used and vent holes used)

Paint applicators (2" black sponge type - one for each coat of varnish - figure 10 - 12)

Stain (gel is nice) Dye works also for colored shells

Varnish or Polyurethane (recommnd Formbys Tung Oil it's nearly fool proof)

Screw Drivers (Flat and Phillips)

Metric Tailors Cloth Tape Measure (\$3.00 in the Wal-Mart craft department)

Soap (bar or dish soap to use in finish sanding)

Carnauba Paste Car wax Car Polishing Compound Car Waxer/Buffer (include a lambs wool sock and wax application sock)

8 heavy Spring Clamps (for homemade veneer ply shells)

Wood Glue (if you add plys or build your own shells - I like Elmer's or Titebond some like Gorilla glue)

Plastic covered Wire coat hangers (to make hanging racks to hang shells from while drying)