

Cherie,
OOPS. Sorry about that last one. Don't know how I managed to copy the same
two pages twice. This one is right.
John

HANDS ON DRUM CRAFTING: BUILDING YOUR OWN DRUM: PART I

In this Series, we will discuss the basic principles of crafting drums, a guide for the drumming enthusiast who wants to explore and discover the art of creating drums. Building your own drums can be rewarding with the right outlook, it teaches not only the physical and mechanical aspects of drums but it also creates a direct relational bond between you and your instrument. The first step is to address your wants and needs. The end result is not simply a drum, but rather drums being used by a happy drummer. It's got to sound good, sound how you want it to sound. Are you looking for sharp staccato toms or thunderous round sounding vintage tubs? Do you like ringing resonance, sharp attack or subdued thumpers? Build drums to suit your musical tastes and take advantage of all the ways you can tweak drums to compliment you and your style.

Your initial decisions will determine the success of your project,

your shell thickness. Thinner shells produce a more fundamental resonant note. As the shell thickness decreases, the body of the drum becomes more prevalent than the crack or attack of the drum. As the shell thickness increases, so does the attack at the expense of the projected resonant tone. Rings can contribute to an increase in attack and provide added stability for thinner shells.

Modern shells without rings have become the "norm" and allow for easy 45 degree edge application (more on edges in the next installment). Due to the modern construction methods, many shells do not need inner rings to solidify their construction. Eight ply toms and ten plus ply bass drums are industry standard as they do mix nicely in two inch incremental sizes and have a sharp well projected easy tuning range which has become popular over the past 25 years. However, these denser shells have that particular sound as their strong point and do not work for all styles of music



so be precise and thorough, especially in the planning stage. Crafting drums is just like crafting music, it is always most fulfilling when you are in full control. Do not set low goals, with diligent planning and practiced patience you can achieve great results. Addressing your needs up front is also the best way to budget your build. Remember, you can always add on later.

SELECTING COMPONENTS

SHELLS: There are a lot of choices when it comes to picking shells for a kit and you will want to first decide the sizes and depths of the drums you'll build. Decide what voices you want to hear and the intervals you'd like amongst the drums. There are many types of shells available, each with distinct character and quality. For the purpose of this article, wood ply shells will be discussed as a) they are the most popular and readily available drum shells on the market and b), they are the most practical option for building whole drum kits. Popular wood types include birch, maple and mahogany, with or without interior rings. Ply densities also vary so you can select

so they may not be the automatic choice for all drum builders.

Even like musical styles can require different drumming presentations. For example, a mellow piano gig may require a different drum sound than a bebop band with bright horns. Just like your cymbal selection, select specific qualities in drums to best suit the dynamics and attributes of your playing and of the other instruments around you.

FITTINGS: Many fittings are available. Aesthetics are important but practicality, durability and versatility should be considered. Mounting component options are vast and there are many types of spurs, tom mounts and bass drum and tom fittings. Choose what you are most comfortable with but well made parts are worth the investment. If you have existing stands and hardware, complimentary components can save money. Don't forget to factor in the little things such as heads, rods, mounting screws. These might seem a nominal cost but can add up quick when building a kit and it helps to plan for each and every expense.

HOOPS: Of all the selected hardware, hoops have the most dramatic effect on the sound of the drum. The differences in the sounds they produce vary greatly and as such can be selected for their sonic attributes.

Wood hoops have been used on drums for ages and excellent choices are available. With maple, birch and rosewood hoops, a seeming "lowering of attack volume" occurs. What is actually happening is the wood hoop excites a lower frequency in the attack of the drum. From out in front of the set, the punch is still plenty present but warmer, woodier and of a lower pitch. Wood hoops also often help focus the fundamental note of the drum. Die Cast hoops have a bright sharp attack which, when combined with thinner shells, makes for a very resonant attack based sound. In lower tunings situations, die cast hoops are not necessary as the added brilliance of the hoop doesn't really compliment the lower tuning

work. There are many drum finishers and certainly local artisans in your area who could help you with these processes. Finishing is a rather intensive art and if you take this route, seek proper reference. There are many good reference books available on the various methods of finishing wood. Patience, this is what your drum is going to look like for a long time to come

TIPS

~ Say you want to build a high pitched, all attack 10" snare. The thicker the shell, the sharper the drum so you'll want to use a 10+ ply shell. Similarly, a 10 ply 10" tom would be all attack and have less resonance and body than if it were a 5 ply shell.

~ Thin ply bass shells produce impressive low pitch workable tunings but, for structural reasons, bass drums under 8 ply should be fitted with rings.

~ Larger melodic sets can greatly benefit from mixing shell densities through the tonal cascade of toms

TOOLS: A quality router and table are essential. If you do not own these or wish to purchase them, you may want to outsource the edge work. Many shell dealers will make you an edge to specification. A straight true edge is necessary to having a drum you can properly tune so make sure that your edges are cut well. A good drill press is useful but a hand drill can be used if necessary. Sharp bits, for both routing and drilling procedures, will insure best results. Other tools you need include a ruler, T-



ranges. Die cast hoops are popular on snare drums due to the cross sticking sound they produce. Flanged steel and brass hoops are available in single, double (stick chopper types), and triple flanged varieties. Brass hoops really sing, they are resonant and warmer than steel hoops which have a sharper attack tone. Each style hoop does have unique tonal qualities so try different types of hoops to see what sound you like best. Make note of the variables in pricing as your hoop purchase can be a significant percentage of you budget.

FINISHES: Plastic wrap finishes are the easiest solution and often the most economical way to quickly produce a durable finish. Veneers are also an option and there are many beautiful varieties to choose from. Some are even supplied with adhesive backing for ease of application. Use manufacturer's recommended adhesives for any bonding work with laminate coverings. Veneer does require additional finish work. Satin and gloss finishes are also options and can range greatly in price. You can do it yourself or shop out this

square, sanding papers and fastener drivers. Work safely, wear glasses and ear protection when using machinery. Know what you are building before you build it, that is the best advice I can offer. Have an understanding of all these fundamental aspects of drum building so your sonic expectations will be met and even exceeded when you are finished. With these basic principles as a guide, spend some time and do some research. Ask around, drum crafting has become a popular hobby for many percussionists and there is a growing professional field of builders who are more than happy to speak with you of their craft. There are troves of information and opinions available if you search. Planning is the key. In the next installment we will get the ball rolling with a special on edge types, designs and crafting

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HANDS ON DRUM CRAFTING: BUILDING YOUR OWN DRUM: PART II

In the last installment, I discussed some of the basic concepts to think of when building a drum. First and foremost, determining the type of drum sound you want to produce and tailoring your project to meet that objective. Hardware choices, drum shells and basic finish options along with suggestions for the necessary tools and machinery and/or when to outsource certain pieces of your building project to skilled professionals were discussed and the basic choices laid out.

Now we will move on to basic design and construction principles used when building drums. Regardless of option variables, shell type or design, these instructions will focus on the basic fundamental processes used to build a quality instrument.

sandpaper for average leveling or 100 Grit sandpaper for single ply shells or more intense corrections on multiply shells. Rotating a shell on this unit with the edge down will create a smooth level surface for both your machine and measurement tools later in the process. Work slowly, checking to keep shell depth consistent at equalateral points around the drum.

THE BEARING EDGE

The bearing edge you select to put on your shells can greatly dictate the voice, range and sensitivity of the drum. With so many different drums out there to use as a basis for comparison, go out and give a



GETTING STARTED

One of the most critical issues of drum design is to perfect the drum to head contact, which is affected by three critical elements. First being shell roundness, secondly edge "trueness" and third the actual edge cut. Any flaws in these areas will ultimately have an ill effect on your project and the sound of the finished product.

SHELL IN ROUND

The easiest way to check for shell roundness is to measure the diameter across the shell at variable points. Eyeballing a shell is not sufficient to determine if the shell is out of round so I do strongly suggest you take the time to measure it out before you begin work on your shells.

TRUE EDGE

Edge "trueness" relates to having the depth of the shell equal all the way around the drum. Wavery edges can cause tuning problems and can make it impossible to cut a true edge. Not all shells are cut exactly true in this regard so you may have to make slight corrections yourself. You can do this simply by building a "trueing" board. I use a 1" polished granite slab but you can also build one using a simple 3"x3" sheet of solid flat MDFB (medium density fiberboard) with great results. Once you have the slab, using two sided carpet tape you will mount atop this board an oversized area of 220 grit

good listen to the variables created by each maker's edge. While doing so, keep in mind drum shell composition and wood types in your comparisons. To hone in on the differences created by different bearing edge types, try paying close attention to similarities in sound between a low quality composition shell and a high quality composition shell, both featuring the same edge design. While the overall sound is definitely different, the attack and tonal spread reactions can be quite similar, just in different frequencies.

THE 45° EDGE WITH OR WITHOUT RINGS

The modern concept of the 45 degree edge can be traced most notably to the switchover in shell types that occurred in the mid 70's. Prior to that time, most US makers were using relatively thin shells with reinforcement rings and a broad interior cut which climbed up the interior of the rings to place the bearing edge on or in close relation to the interior ply of the drum. This was then applied to the thicker ringless shells in the same manner, whether by design or not, but consequently placing the bearing edge at a different point in the shell. The easiest examples of this transformation can be seen on Slingerland and Ludwig shells when they switched from 3 ply with rings to 5 ply ringless shells. The sound of the drums dramatically changed at this point to create a more attack driven sound versus the full bodied resonance of the previous era's drums.

With the advent of the modern 45 degree edge on a ringless shell, the drum's bearing edge has shifted from the innermost edge of the

shell towards the middle or exterior portion of the shell and realigning the edge to head contact area. When you outward cut the shell, the interior plies become less of a vibratory and resonant component and more of a vibratory transducer and a consumer of the drum's total energy, eating certain harmonics of the drum and muffling or reducing some of the spectrum of the drum's total voice. These attributes are often used to advantage as they present a somewhat pre equalized drum sound, a feature which made the 45 degree edge on ringless shells a popular choice of many drum builders from there on out. In the Late 70's early 80's, companies began moving the edge back towards the interior of the shell as found on the Tama Superstars for example. These edges do tend to lend to a very focused, fundamental note orientated drum and gained these makers much acclaim in the genres they work well in. For a crisp, sharp attack in high or low tunings, a very easy edge to tune, stable head seating and tunings at variable ranges and tensions and finally (and most important to the novice drum builder), for the easiest edge to cut, the 45 degree edge is probably your best choice. Alternately, once can create a vintage style bearing edge by

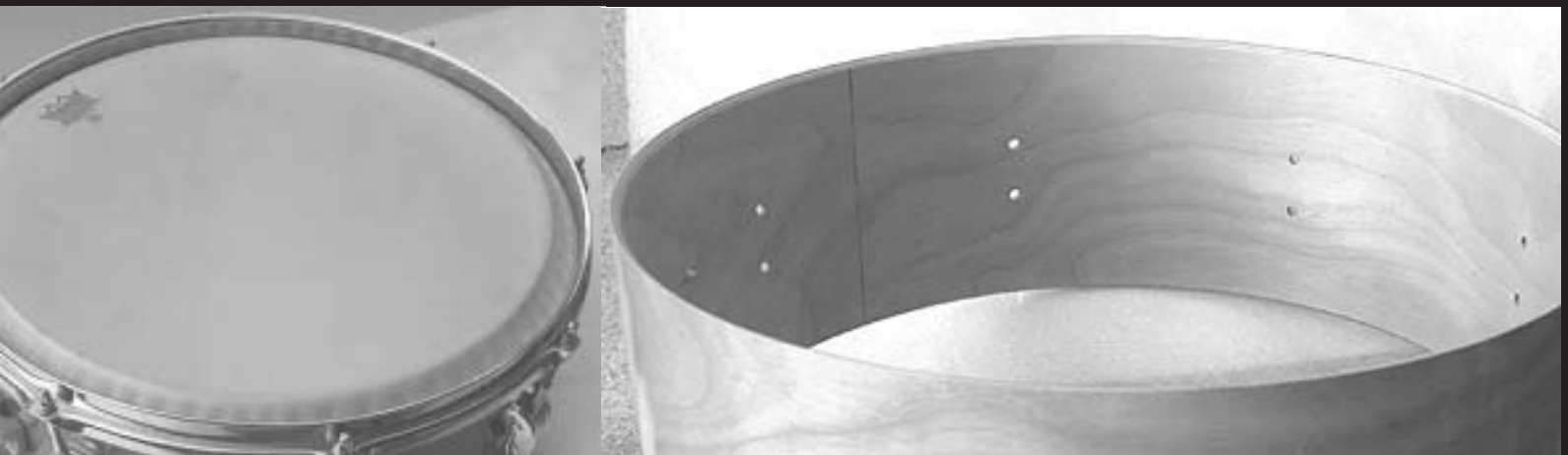
If you plan on using rounded or calf cut edges, you should have the edge work done professionally by an experienced drumsmith as to have a good example for future build projects and/or to leave this challenging and practiced task to the professionals.

BEARING EDGE THICKNESS

How thick or thin the actual area where the bearing edge meets the heads can determine a few elements of the drums sound. You will find that the greater the contact area, the less dominant the high/mid frequency and attack or let's say it creates a more balanced spectrum than a thinner or sharper bearing edge which lends to more cutting and crisp high and mid frequency orientations.

COUNTERCUT

On most makers drums, there is some form of counter cut. Sometimes this is the inversion of the 45 degree edge making a double 45 degree bearing edge. Some makers use only the slightest



purchasing drums shells with rings and creating a similar 45 degree cut which, when factoring in the ring, would land the bearing edge right on the inner ply of the drum shell and fully excite the inner ply of the drum. Similarly, with alternate edge cuts, the interior plies become an inherent part of the drum's voice.

CALF CUT OR ROUNDED BEARING EDGES

Another very different bearing edge type is the rounded or Calf cut bearing edge. These edges can create quite dramatic effects on a drum's sound and are worth mentioning. A very important principle of this edge type is that the head, under tension, is in direct contact with more of the drum thereby directing more vibration into the entire drum versus the 45 degree edge cut in which the head is only in contact with a few plies of the drum shell. A plus of utilizing the rounded bearing edge is that it produces drums that are typically more resonant, rich in harmonic spectrum and tonal presence. However, the sound can become boxy on this edge type in very high tunings and hand working is often required. Tuning ranges, while full and melodic within their scope, can be narrow in comparison to the flexibility offered in a 45 degree edge. Calf cut edges are exemplified by the smooth rounded inward curve from the outer shell towards the inner ply. A good example of a vintage round over edge can be seen on the older radio king snares. It's easy to see the extreme difference in contour as opposed to the modern 45. These edges are often associated with drums with bright attack and a cascade of tonal resonance.

round over to the peak of the bearing edge interior cut. The width and depth of the counter-cut are therefore complimentary and in association with the chosen selected edge type. This counter-cut in and of itself can create the calf cut edge style. These slight cuts will allow for easier head seating and tuning by eliminating the drag of a 90 degree angle against the head when tensioning. This also allows for better tuning stability as the edge can create its contact point versus just fitting into the preformed angles of most manufacturer's heads.

So, these are the basic choices for your edge design, construction and layout. The quality and type of bearing edge you choose will have a dramatic impact on the sound of your end product. I hope I've given you some ideas to think about in terms of options available to you. Again, I strongly suggest you find drums to listen to which have the sound you're after and base your decisions on that, after all, why reinvent the wheel? There is much to learn by way of observation and many drumsmiths along the way have given us their experiments and ideas to learn from and build upon. Out of respect we should pay homage to their works and discoveries when embarking upon new ideas. There are tons of options to choose from and use as prototypes for your own ultimate build. There's a lot to what makes up the sound your drum produces. The more you understand ahead of time what you want that sound to be, the more likely you'll succeed in making yourself a perfect drum.