

Excellent tuning is dependent upon instrument quality and construction, drumhead quality, construction, acoustics, and knowledge of a tuning process that produces the most resonant drum tone.

Drum Shell Shape

- A. Diameter. Smaller diameters produce higher pitch, fewer overtones, less sustain, and better stick response.
- B. Depth. Deeper shells produce lower pitch, increased projection, and increased volume.

Shell Materials

- A. Density. Harder shells produce more sustain, more overtones, more volume, and brighter tone (more high frequencies).
- B. Thickness. Thicker shells vibrate less and produce less sustain, less volume, and fewer overtones.

Drum Heads

- A. Thicker (higher mass) vibrates less and slower - producing less sustain, lower pitch, fewer overtones, more low frequencies, less volume, less stick rebound, and more durability.
- B. Sanding coated drumheads. Use a fine grade sandpaper to lightly smooth the rough coating. This improves brush sounds and slightly increases the resonance of these heads. This is also useful on tom tom heads.
- C. Culling heads. When purchasing heads you should cull them to

guarantee a quality sound. Suspend the head vertically by thumb and first finger. Tap near center with other hand. Listen for a low full tone with a long natural decay. Avoid heads that rattle, sound papery, or are dead sounding.

Drum sticks

- A. Weight-mass. Heavier and/or larger sticks produce more volume, lower pitch, lower frequencies (darker tone).
- B. Tip density. A softer tip produces less volume, lower pitch, more low frequencies, less stick rebound, less attack sound.
- C. Tip size or contact area. A larger contact area produces more volume and a darker sound.

Basic tuning concepts

- A. Maximum resonant frequency. Every drum has one pitch that resonates loudest and sustains longer than any other pitch because of the drum's interior acoustics. Find this pitch by gradually tuning from low to high.
- C. Overtones - higher tunings can cause more overtones.
- D. Stick response - the tighter the head the greater the stick response.
- E. Room acoustics - certain frequencies are more resonant in each room and this can change dramatically by moving the drum around the room.
- F. Generally, the batter head determines the feel and attack, the resonant head determines the pitch and sustain.
- G. Toms and bass drums will achieve maximum resonance when

both heads are the same material and tuned to the same pitch.

Removing old drumheads

- A. Remove old head
- B. Clean bearing edge, lugs, shell, and counterhoop.
- C. Check tightness of all fasteners on shell
- D. Lubricate lugs with lithium grease

Mounting the head – seating the head

- A. Place head over shell, attach the counter hoop, center head over shell to assure an even tension around its circumference.
- C. Thread lugs (lubricate them at this point) until just finger tight (be sure to apply tension in the following order as visualized on a clock 9-3, 12-6, 10-4, 8-2).
- D. Drum key tension each lug in half-turns until the head is well above the desired pitch. Allow the head to sit (unplayed) for 24 hours to allow for stretching, i.e. seating the head.
- E. Check the pull-down evenness of the heads with a ruler or veneer caliper. This assures consistency by measuring the distance of the counter hoop to the top of the lugs.
- F. Do not tune the drum to its highest range immediately. Rather, allow the heads to stretch and settle slowly over at least several weeks or you will over-torque the heads and render them useless - the sound will become dull and devoid of tone and ring.

Clearing (fine tuning) the head

A. Tap the head with a drum key about 1 inch from the rim near each lug with exactly the same amount of force. Each lug will typically produce a slightly different pitch. Find the lug that produces the highest pitch and consider it as the first lug, as described in the clock procedure above. This is the reference lug. Tighten the lug across from it until the pitch matches. Proceed through the lug order as described above. If you have trouble hearing the exact pitch, turn the lug in and out one half turn and listen to the pitch go sharp and flat. It is better to tune a lug up rather than down, because tuning down will not allow the head to seat completely over the bearing edge and the head will go flat. When you must tune down, be sure to turn the lug below the desired pitch and then bring it back up.

B. When all lugs are pitch matched the head is "cleared".

C. The fundamental pitch may be changed by adjusting each lug the same amount. Be sure to use only small increments at this point – a sixteenth, eighth, or quarter turn.

D. A newly mounted and cleared mylar head will quickly go out of tune as it stretches. Further, it will not stretch the same amount at each lug, so continued fine tuning is necessary. This process may continue for a week or two until the head reaches its final stretch.

E. Minor tuning adjustments will be necessary to maintain a cleared head throughout the life of the drumhead.

F. Placing your finger or a small damper pad (gel pad) in the center of the head may make it easier to hear the pitch near each lug.

Comparison of one and two-headed tom toms

1. Two Headed Drum. Less volume - resonant head diffuses some of the direct impact sound. More sustain - two heads vibrating sympathetically prolong the tone. More stick rebound and head durability - air compresses inside the drum giving the batter head more resilience. Consistent pitch for the duration of sustain - prevents pitch from lowering as the vibrations decay. Multi-directional projection.

2. One headed drum. More volume. More attack. Less sustain. Less stick rebound and head durability. Pitch drops from impact to end of sustain - head's vibrations slow down and decrease in size during the decay. Unidirectional projection of sound - out the bottom of the shell.

Head tuning relationships on two-headed tom toms

1. Batter and resonant head in unison - drum produces a distinct pitch with few conflicting overtones. The most resonance is achieved by using two identical heads because polymers of equal thickness vibrate similarly to each other when the tension is equal.

2. Resonant head lower. Produces more stick rebound, permits lower fundamental pitch without sacrificing stick rebound.

3. Resonant head tighter. Produces less stick rebound, but allows lower fundamental pitch.

Tuning top and bottom heading to different pitches may produce unwanted overtones because the two pitches are dissonant -

especially major or minor second, tritone, sevenths, etc. Try thirds, perfect fourth or fifth, or sixths.

Sympathetic snare vibration caused by other drums

Usually another drum tuned to, or near, the same pitch as the snare resonant head causes this problem because two heads are vibrating at the same speed. Decide which head to change.

Snare tension. If the resonant head is too tight, the head will not seat itself as well into the snare beds.

Snare drum tuning – for single ply medium weight heads

1. Mount the resonant head first, without the batter head on the drum. The goal is to identify the lowest possible resonant tone.
2. Tune each lug up one-half turn to one turn.
3. Mount the batter head, as described above, and match the pitches of both heads.

4. At this point you have several sound/style options to choose from:
 - A. Fat/wet sound = low pitch resonant head. Increase the batter head tension a third or fourth above the resonant head. This produces excellent stick response/feel.
 - B. Pop/studio sound. Increase resonant head tension about a minor third.
 - C. Maximum resonance. Increase resonant head tension in small increments while listening for the point of maximum resonance

between the heads.

D. Articulate = high pitch resonant head.

5. Once you have achieved the style of sound you desire, the overall pitch of the drum can be raised as desired. However, you must maintain the tuning interval between the heads.

Do this in minute increments and notice how the drum will go through unique sounding zones; either relatively clear pitch or one that contains a phase cancellation, where the drum drops in pitch. This dropping effect, the Doppler effect, is most noticeable when the heads are at different pitches or you are using different weight heads.

Bass drum tuning:

1. A standard tuning concept is to have the batter head control the attack portion of the sound and the resonant head to control the "sustain" portion of the sound.

1. For a punchier sound tune the batter head higher. The resonant head will need to be near the wrinkle (rattling paper sound) point to permit a low pitch.

2. A low resonant tone is easier to achieve without a pillow touching the resonant head.

3. Do not tune the batter head extremely low. This produces a slappy plastic sound that does not project well.

4. A fat bass drum sound is achieved the same way a fat tom sound is achieved. Tune the resonant head to the lowest note, and then detuning a slight amount (1/16 to 1/8 of a turn), which

creates a "fat, loose or dark" drum sound. The batter head is then used to vary the pitch.

5. For a short "open" burst of resonant tone, followed by a muted overtone, try using one of the EQ pads placed loosely against either head so that when the beater strikes the head, the upper portion of the pad (the "hinged" section) floats away from the head yet returns quickly. You can control the duration of the sound by the positioning of the pad. This also works when using 2 pads where one remains firm against the head while the other on top or against the other head provided the "hinged" sound.

Dampening.

- a. Batter head. Dampening is usually not necessary if using a sound control head.
- b. Resonant head. Use a felt strip placed near the center of the drumhead. Mount tightly between the shell and the head or between head and counterhoop. Try 4.5" on a 20"; 5" on a 22"; 5.5" on a 24".