Mid-Section Tone and Tuning

By Greg Bassani
APBA Drumming Principal

Introduction

I think we have come a long way in fairly short space of time with pipe band Mid-Sections (or 'Bass Sections' as many of us more commonly call them). Today, mid-sections can make a positive contribution to the band's ensemble presentation through the use of multi-pitch instruments and affective scores. However, there is also the potential for "multi-pitch melt-down" in a variety of ways, such as:

- Scores that are too busy and detract from the melody.
- Imbalance in volume, causing the mid-section to overwhelm the band.
- Pitch and pitch intervals of drums not being harmonious.
- Tonal characteristics of the drums being unpleasant.

Tonal Characteristics

I especially wish to comment on the last point in regard to the unpleasant tonal characteristics of drums of the 'tenor' kind. Firstly, you should be aware that the sound of the tenor drum is comprised of a dominant vibration, called the 'fundamental', along with many other vibrations occurring at the same time, called 'overtones'. The combination of vibrations of 'fundamental' and 'overtones' produces the Pitch and the Tone of the drum.

To take this one step further, it is the fundamental vibration that is responsible for the Pitch of the tenor drum. This is the vibration that occurs when the whole drumhead moves inwards and then outwards at something like 120 times per second after a single strike from a stick. Impressive! The additional vibrations of the drum head, occurring at the same time as the fundamental, are the overtones which are not harmonious. In other words, the overtones will not blend with the fundamental or anything it is tuned to, such as the pipes.

A good animation of a vibrating drum head (for those who are keen to know more about the physics of music) can be found at: http://www.kettering.edu/~drussell/Demos/MembraneCircle/Circle.html

The Fundamental Note

Now I'm getting to the point (finally, you say). When the drum is tuned to the pipes, it will be the fundamental note and not the overtones that are responsible. Therefore, hit your drumhead in the centre to encourage a sound that is dominated by the fundamental note. The fundamental and overtones together are responsible for the "tone" of the drum. If your drum is set up in such a way that the sound is rich in overtones then it will likely sound unpleasant and un-tuned (the fundamental note has been swamped by overtones). I have heard such sounds in recent contests and made comment on the judging sheets that the sound detracts from the ensemble effect.

Here is some food for thought:

- Just because a specific model/brand of drum is on the market and is offered for sale does not mean that it has a design that will produce good tone. 'Popular' does not necessarily mean 'good'; it may just mean popular!
- Beware trends in pipe band tenor drum design. Drum pitch is determined by the volume of air in the drum and the tension of the heads. The same pitch can be produced by a wide-diameter shallow drum and a small-diameter long drum.

However, their tonal characteristics will differ significantly and the wider one will generally sound better due to lower overtone content.

- Each of the mid-section drums (including bass) will have a "best range" of pitch that it can produce. You wouldn't pitch a tenor drum at the note of the bass drum, any more than you would pitch the bass drum up to a tenor note. It can be done but the overtones would be leaping out of the drums and grinding away at your ears. The point here is that you must ensure the pitch you are trying to achieve is within the capability of the drum to produce, with low overtone content. Sometimes you can push the boundaries by making careful drumhead selection and/or by using additional damping mechanisms to keep the overtones at bay.
- For judges to be able hear dominant overtone content of a tenor drum from their position outside of the circle must mean that the drum is literally overflowing with discordant vibrations. Nasty discordant sounds is not what makes for good pipe band ensemble.
- Other things that will affect the tonal characteristic of your drum include: stick hardness, striking position on the drumhead, type of drumheads, relative tensions of top and bottom heads, and strength of the beat. Overtones can be further suppressed by using "Remo Muffles", drum heads with double layers around the outer edge or double layers across the entire drumhead area, and felt strips.

The Critical Link

As we move into the Ensemble area of assessment in Australian pipe band contests, our bands should use this as an opportunity to review the set-up of their mid-sections to ensure they are producing harmonious sounds that are sympathetic to the pipes. Snare drums produce an 'acoustic effect' that has evolved over many years and they are not harmoniously tuned to the pipes. You cannot place a snare drum "note" onto a musical scale. The mid-section is therefore the critical link in the pipe bands that has both the elements of percussion and tuning. It will rightly attract the attention of ensemble judges in their consideration of the "tonal integration" of the band and you would be wise to prepare for it now.