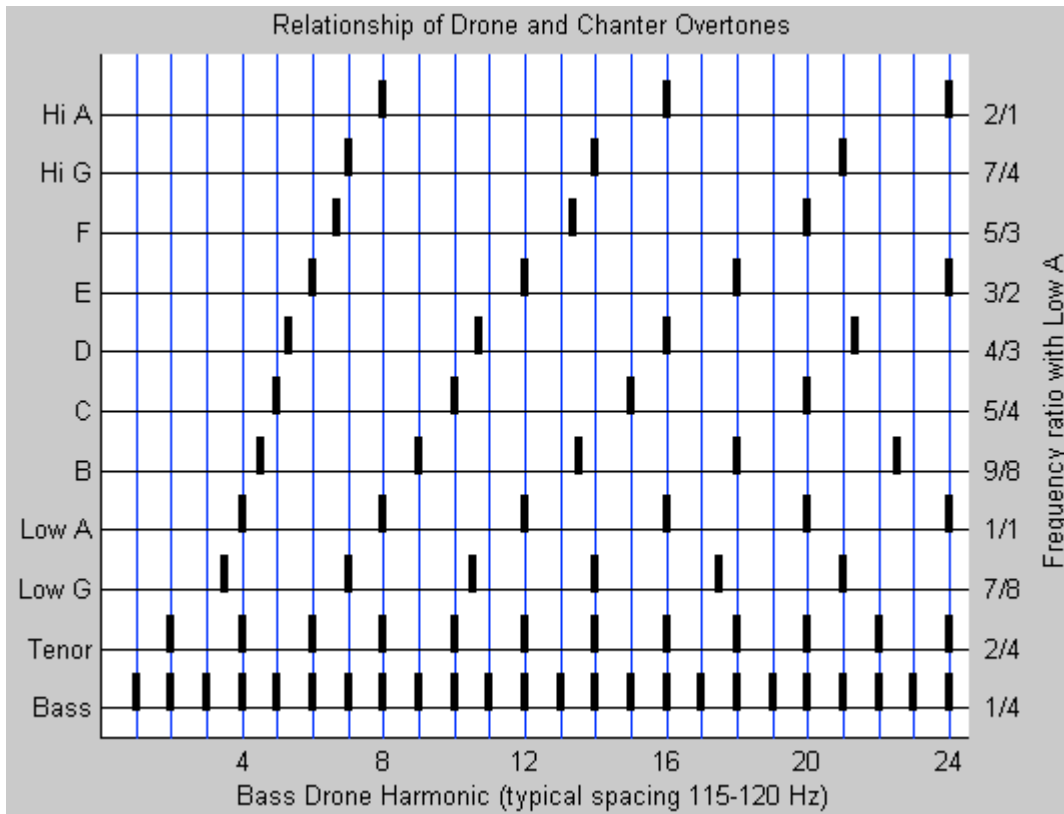


Harmonics

The graph below shows the fundamental frequency and its overtones or harmonics that occur as multiples of the original frequency. So if the bass drone vibrated at 115 then each of the black lines across the bottom would be multiples – 230, 345, 460 etc.

This graph shows the relationship of the notes of the chanter to the drones and how they line up. What it does not show is the frequency of any notes or drones nor does it indicate which overtones or harmonics are louder than others. But it does show that at some point every note does line up with some harmonic of a drone.



Harmonics add to the complexity of the sound and brings color to the sound as opposed to a plain sound of a tuning fork's pure one tone pitch.

Some harmonics appear louder than others and so change the sound of the note to make it appear to have more volume or less than others. Reeds and makes of drones and chanters all affect the color of the sound and how much change you hear in the notes. Drones with a lot of harmonics will appear fuller and buzzy. Chanter notes also have harmonics that also blend in so this also adds to a perceived volume in each note.

The blending in of these harmonics gives the drones a different sound to the human ear as you play the different notes.

An example of this is the strong harmonic in the bass drone that lines up with the note C. If the note is perfectly in tune you will notice a stronger bass sound to the drones when a long C is played.