

Tuning a Barbershop Chord

Have you ever wondered what your director means when he tells you to “sign to the top of the note?” Do you scratch your head when someone tells you “fifths should be sung a tad sharp?” If so, read on. By the end of this article you should know why the need to tune a barbershop chord leads to such puzzling advice.

OVERTONES, FIT, & BEAT

Let's start with the simple fact that all sound is created by something that vibrates - stacking up the air to create sound waves. If the vibrating object sends out irregular waves, like hitting a piece of wood, we perceive the sound waves as noise. If the vibration is consistent, like plucking a guitar string, we perceive a musical tone. Different pressures create different frequency waves. Different frequencies make sounds of different pitches.

Your vocal cords vibrate in a consistent way. But did you know that whenever you sing a note you are actually singing a chord (of sorts.) That's because every fundamental musical vibration is accompanied by multiple higher frequency vibrations called overtones. They are very faint and decrease in volume as the frequency gets higher.

This mini-science lesson is very important because it is the production and matching of these overtones that gives us the spine tingling, goose-bump producing barbershop ringing chord.

When two or more different musical frequencies are played together they interact. (Think of two parts in a quartet.) If these sound waves fit together, we hear a pleasing sound. To fit there must be a simple ratio between the two - like one is twice the frequency of the other, or it's three times as fast as the other.

Notes that “fit” will often have a few of their overtones in common. When those notes are sung simultaneously those common overtones reenforce each other and become loud enough to be heard as a fifth voice. This helps produce the expanded sound that is associated with barbershop music.

However, if two or more frequencies don't “fit,” you will likely hear a pulsing sound. (Not a good thing.) In scientific circles this is called a “beat.” You can experience the beat by singing along with a sustained note on a Learning Track (say at the end of a tag) and lowering your pitch just a little.

Listening for this beat when you sing will help you know when the pitch needs to be adjusted slightly.

“JUST” VERSUS “EQUAL TEMPERAMENT” TUNING

Given that notes that “fit” are those which have a simple ratio-relationship with each other (2:1, 3:1, etc), barber-shoppers tune the pitch of their various notes to these same ratios. It is called “just” tuning or intonation. This type of tuning varies with the key you are using at the moment. Tuning for C Major is not the same as for D Major.

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We rely on tuning by “ear” to produce just the right sound to blend with the other three parts, producing a beautiful, harmonic sound regardless of key. The “just” scale can be used because the human voice is a very flexible instrument.

While the human voice can differentiate between an A# and a Bb, the piano has a single key for both. That is because a compromise tuning system, called equal tempered tuning, was developed for fixed-pitch instruments like the piano to allow music to be played equally well (or badly) in any key without adjustment. Sheet music is written in equal tempered intonation.

How much is the difference between a note in one system or the other? Not much. But in Barbershop, the difference is what hooks us and keeps us coming back.

FIGURE 1
Comparison of Just- and Equal Temperament-Tuning

Note	Frequency		Difference between tuning systems
	Just tuning	Equal temperament	
A	440.00	440.00	0.00
B	495.00	493.88	1.12
C #	550.00	554.37	-4.37
D	586.67	587.33	-0.66
E	660.00	659.26	0.74
F#	733.33	739.99	-6.66
G#	825.00	830.61	-5.61
A	880.00	880.00	0.00

Barber-shoppers often talk about tuning horizontally and vertically. In practice, most Leads rely on an approximation of an equal-tempered scale for the melody (as written in the sheet music) to which the other voices adjust vertically (with each other) in “just” intonation.

So when someone tells you to “sing the top of the note” or “fifths should be sung a tad sharp”, they are telling you to use “Just” tuning to find that ring.

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WHAT THIS MEANS FOR YOUR BARBERSHOP SINGING

- The notes written on the sheet music might not be the exact ones that you need to sing to make the chord ring, you might have to sing slightly sharper (higher) or flatter (lower) to tune the note and get that “lock and ring”.
- The chords that ring are major chords and 7th chords. The dominant seventh-type chord is so important to barbershop harmony that it is called the “barbershop seventh”. BHS arrangers believe that a song should contain dominant seventh chords anywhere from 35 to 60 percent of time (measured as a percentage of the duration of the song rather than a percentage of the chords present) to sound “barbershop”. Generally, the root of the chord must be tuned to the tonal center; the 5th must be tuned on the high side, and the 3rd and minor 7th must be tuned on the low side (in comparison to equal temperament).
- If you have two consecutive notes in the music that are written as the same note, it’s likely that you will need to adjust your tuning for each note. It is necessary to tune vertically on each note to get the chord to lock, particularly if the other parts are moving around you.
- If you learn from computer generated learning tracks, they will almost certainly use equal tempered tuning, so won’t have any lock and ring – be aware that when you sing it yourself the notes might sound different! Getting learning tracks that are actually sung maybe more expensive, but they are more accurate – which can feel counter intuitive.
- If you are struggling with a note when you are learning a new song sitting in front of a piano, don’t worry. When you sing it in person, with the rest of the chord around you, you are likely to sing the note without any issues as your ear will find it. It may turn out that the note you need is in between the ones that you can play on the piano.
- The Lead and the Bass will most often be on the notes of the chord that need the least tuning – the Bari and the Tenor are normally on the notes that need the most tuning – often leading to the commonly seen “Bari shoulder” and the “Tenor tiptoe”