

Tech Tip: EQ Curves and Musical Style

Do certain styles of music have a "signature" EQ response? Check out the following curves, and decide for yourself.

By Craig Anderton

Look at music with a spectrum analyzer, and you might be surprised at what you see. For example, if you analyze a bunch of music that belongs to the same musical genre, you'll start to detect a pattern with respect to how energy is distributed over the frequency spectrum. Granted, it's impossible to generalize for all types of music within a genre, but there are often recurring similarities that can be pretty interesting.

The curves shown in this article were researched by Har-Bal (www.har-bal.com) who make EQ-oriented mastering software. Har-Bal is not a "curve-stealing" program (like Steinberg's FreeFilter or Voxengo's Curve EQ) that impresses the spectrum of one song onto another, but allows displaying "reference curves" if you like a particular sound, and want to see how your master differs from it.

In the process of developing Har-Bal, the company thought it would be helpful to include typical frequency response reference curves for different types of music. Analyzing them yields some interesting clues about EQ's relationship to style; in all of the following examples, the upper (yellow) curve shows peak power, and the lower (red) curve shows mean power.

Dance/Techno

In Fig. 1, the hyped low end around 80Hz corresponds to the strong kick and bass line. There's a slight dip at 5kHz, but then the response climbs up again in the treble range to give presence and sizzle. This results from the accented high-hat and percussion parts, which help propel a song's rhythm and is a crucial element of dance music.

The rest of the curve is relative flat, where all frequencies are emphasized. The object is to produce loud, pounding music that gets people moving on the dance floor, and that's what this curve indicates.

Fig. 1: Here's the spectral response curve for a typical techno song. Note the "bump" around 80Hz, which indicates a strong kick drum and bass.

Classical

The most distinctive characteristic here is the rapid rolloff in the treble range (Fig. 2), as you'd expect from acoustic instruments and a sound that doesn't include thrashing synths, synths with huge amounts of harmonics, or boosted treble for radio play. The bass bump may be a bit surprising at first, but orchestral bass drums, tympani, and double-bass contribute a lot of energy to the final sound.

Fig. 2: Classical music typically adds very little processing (either EQ or dynamics), which results in a lower amount of high-end energy.

Rock

Fig. 3 displays the strong bass typical of rock music, but note there's also a lot of midrange action in the 500Hz-3kHz region from guitars, vocals, leads, and so on. The highs aren't quite as hyped as the techno curve because there aren't as many electronic instruments, although cymbals and distorted guitars can add a fair amount of high-frequency energy. As a result, there's a more natural rolloff that resembles the classical curve, but with more high frequencies.

Fig. 3: Rock music tends to have a lot of energy in the midrange region.

R&B/Hip-Hop

Like rock music, Fig. 4 shows there's a significant midrange emphasis due to vocals and instruments such as guitar, piano, synth, etc. But also note that there's definitely more bass (check out the energy in the kick and bass guitar/synth bass range), as well as a bit more high-energy action. The lower mids around 200-300Hz are down a bit; this generally produces a cleaner, less "muddy" sound that's indeed characteristic of a lot of R&B and hip-hop.

Fig. 4. The R&B/hip-hop curve is similar to rock, but with more lows and highs, and a bit of a dip in the lower midrange.

Folk

The curve in Fig. 5 is for an acoustic folk ensemble. As befits acoustic music without significant amounts of drums or bass, the accent here is on vocals, guitar, and other midrange instruments. Bass and treble both fall off substantially; unlike classical music, you don't have powerful instruments in the bass range (like tympani) to contribute large amounts of low-end response.

Fig. 5: The curve for folk music is quite similar to classical, which is to be expected as both forms of music favor acoustic instruments.

Adult Contemporary

This is also called “new age” music or easy listening. This type of music is designed to accent melody and not produce sizzling highs or pounding basses, which Fig. 6 clearly indicates: There's a significant amount of midrange energy, and a gentle tapering in the bass and treble regions. However, note there is a bit of a peak around 7-8kHz. This is characteristic of tunes that include bright percussion, like shaker, tambourine, maracas, and the like.

Fig. 6: Although the highs and lows taper off somewhat as with acoustic music, note the high-frequency “bump” characteristic of percussion

So What Does It All Mean?

These graphs are designed to illustrate some points about spectral distribution in certain types of music, not serve as a “rule” about how music should sound. Still, as you're mixing, it's useful to know the characteristics of other music in the same genre, so your song can slide relatively easily into a playlist. For example, if you're mixing dance music and you don't have a prominent kick and some high-end sizzle, the music will sound weak when compared to other dance music.

As always, your ears need to be the final arbiters of what sounds correct. But given the importance of EQ in producing a finished master recording with a commercial sound, the more you know about what you're doing, the better!