JL AUDIO®

Ahead of the Curve™

"What the heck is a parametric equalizer?"

The JL Audio 500/1 (and the upcoming 1000/1) employ a sophisticated parametric Bass EQ circuit. A parametric equalizer is distinguished from a conventional equalizer circuit in that it allows the user to not only control the level of the boost, but also the center frequency of the boost and the bandwidth of the boost (the range of frequencies affected).

What does this mean to you when you set up a system? First, it allows you to tailor the properties of the EQ circuit to do what you need for each system. In some cars, you will need some help in the upper bass. In others, you will need it at lower frequencies. By adjusting the bandwidth with the "Q" knob, you can control the width of the range of frequencies affected by the boost. So, whether you need a sharp/focused boost or a broad one, at 30, 40, 60 or 80 Hz (or any frequency in between), the parametric EQ gives you the power to make it happen.

The following diagrams illustrate what each of the three controls of the parametric Bass EQ do in isolation. It is important to understand these behaviors, because they must all be considered when setting up the Bass EQ.

Some basic tips to get you started in the exploration of the Bass EQ...

1) Set your amp gains with the "Bass EQ" defeated ("off" position). You want to set the bass level properly BEFORE applying any equalization.

2) As a general rule of thumb, start tuning with a "Q" setting below "2". Higher "Q" values are rarely needed unless there is some truly bizarre acoustic problem in the system. Lower "Q" values give you a broader (and usually more natural-sounding) effect. A "Q" of "1.6" (12 O'Clock setting) is a good starting point.

3) For most systems, the best "Center Frequency" adjustment will be between 40-50 Hz. Use 45 Hz (12 O'Clock setting) as a starting point and adjust up or down gradually.

4) Don't go crazy with the boost knob... there is 15dB of boost available (which is a lot). Begin with a low boost setting (around 3 dB) and try to stay below 6 dB whenever possible. Remember that for every 3 dB of additional boost you dial in, you are asking the amplifier to double its power output for a given signal in the boost region.

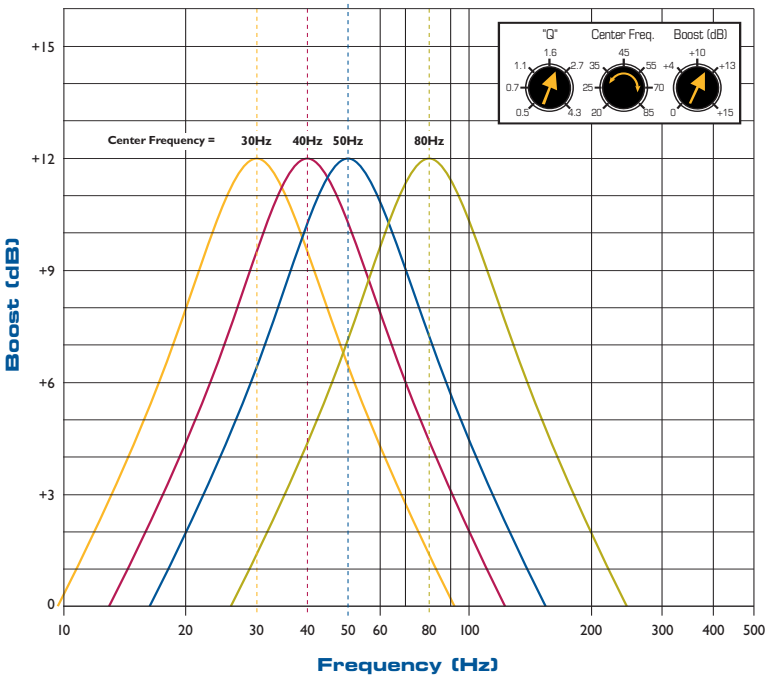

Figure 1: This diagram shows the effect of different "Center Frequency" settings with the Bass EQ set up as follows: "Q" = 2.0, "Boost" = 12 dB

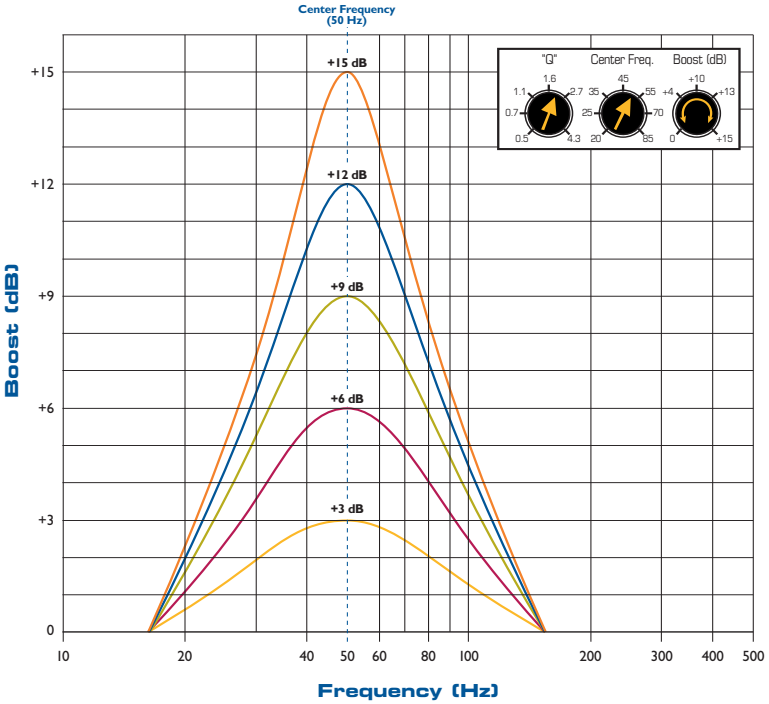

Figure 2: This diagram shows the effect of different "Boost" level settings with the Bass EQ set up as follows: "Q" = 2.0, "Center Frequency" = 50 Hz

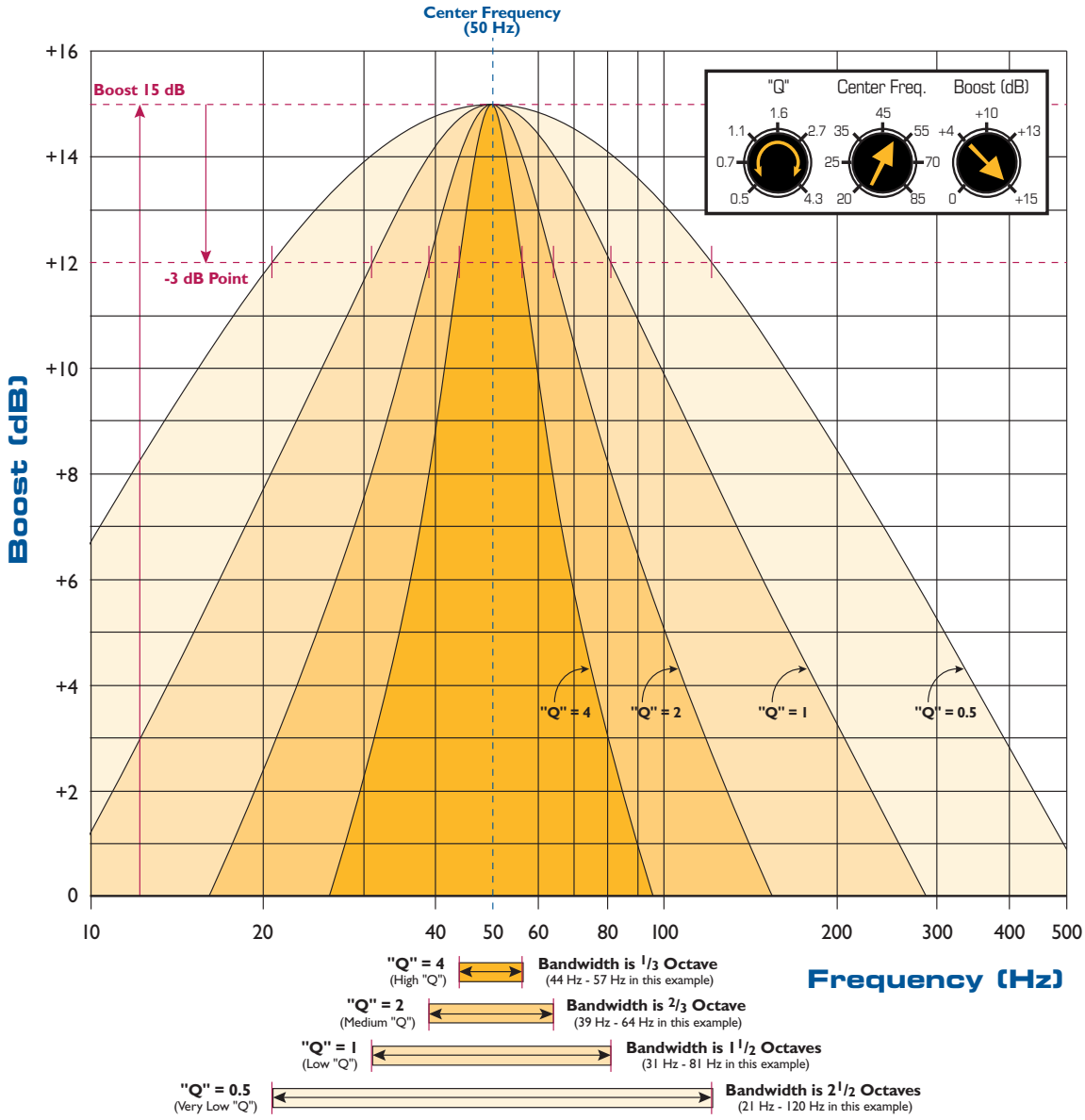

Figure 3: This diagram shows the effect of different "Q" (bandwidth) settings with the Bass EQ set up as follows: "Boost" = +15 dB, "Center Frequency" = 50 Hz

What is **"Bandwidth"**? This term is borrowed from filter theory and is defined as the range of frequencies passed by the filter (or in this case, boosted by the filter).

Bandwidth is always specified in terms of **"-3 dB points"**. Basically, we note the highest level of the boosted signal and determine at which frequencies the level of boost drops 3 dB below that highest level. For an EQ filter of this type, there are two -3 dB points, one at a higher frequency and one at a lower frequency than the peak. These -3 dB points define the bandwidth.

The bandwidth for each "Q" setting will always be consistent in relation to octaves for a given boost level. Above, we show you the octave bandwidths for the "Q" and boost settings illustrated in the chart. **Figure 2** and **Figure 3** illustrate that at higher levels of boost, you are not just boosting frequencies within the defined bandwidth. There will still be considerable boost outside the defined bandwidth, especially with lower "Q" settings.

Please note that the "Q" setting marked on the amplifier is referenced to maximum boost. "Q" will drop in value at boost levels lower than maximum (see **Figure 2**).