The 20Hz-20kHz Reality Check

You will frequently see "20Hz–20kHz" associated with many pieces of audio equipment. Here is a reality check regarding this often-misunderstood specification. This "spec" is not precisely the same for all individuals, as each person's hearing capabilities vary and change over time. The 20Hz–20kHz rating is essentially a set of "misinterpreted" numbers that many so-called audio "experts" have implanted in their heads as completely accurate. The notes below may help you decide for yourself if this specification is as accurate as depicted.

Notes regarding the 20Hz-20kHz Specification

- **The Lower Frequencies between 20Hz and 60Hz are "felt" more than they are "heard." The 20Hz-60Hz range is commonly considered the "Sub-Bass frequency range.**
- **Actually, there are almost no audio signals used below 35Hz (but of course there will be exceptions).**
- **60Hz – 250Hz is the frequency range where the human ear can start "hearing" most bass sounds.**
- **60Hz is also the frequency of AC power – which you are most likely familiar with – it's that annoying hum that you sometimes here in your PA system. This is typically (but not always) the result of Cable / Shielding / Grounding issues, and cables being in too close proximity to really strong magnetic fields.**
- **The average higher / upper frequency limit in adults is actually closer to 15kHz to 17kHz for some, but most adults cannot hear much of anything above 16kHz.**
- **Above 12kHz it is typically just noise, and this frequency is hard to project past 20-30 feet.**
- **Human hearing starts to decline with age, especially in the higher frequency ranges.**
- **20Hz to 20kHz is also commonly referred to as "Full Range" by some manufacturers.**
- **20Hz to 20kHz is also used in advertisements, and as a sales pitch to promote audio products to the unsuspecting buyer. Manufacturers will make every effort to "justify" this specification – buyer beware!**

Final Notes regarding the 20Hz-20kHz Specification

It can also be argued that any extended frequency response below 35Hz and above 16kHz that can provide a better "phase" response may improve a sound system's sound quality/fidelity. Keeping this in mind – If a system were designed for 35Hz to 16kHz, it would sound suitable to most of the listening audience, and a system designed for 25Hz to 18kHz would be an excellent "sound" experience for most of the listening audience. Not exactly 20Hz–20kHz, but close enough.

What does all this mean? The 20Hz–20kHz specification is not exactly what it appears to be. It can also be an expensive waste of effort, time, and equipment when considered for the wrong reason. The right reason is to use whatever "specifications" are needed to design sound systems to get the highest possible quality and fidelity.

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