

## Tip #24 How Much Power Do I Need?

This is one of the most commonly-asked—and important—questions in audio. It's like trying to recommend to someone how much food they should eat for dinner. How hungry are you? What food do you enjoy? Was lunch 3 hours ago or 6 hours ago? See? It's not so clear-cut.

The first thing to do is to look realistically at your goals. Do you want to just have an involving, satisfying movie experience when watching *The Bobby Darin Story*, or do you want to impress the bejeebers out of your friends when they come over to watch *Terminator 3*? Once you know how loud and bombastic you want your system to play, you can choose the speakers and amplification needed to do the job.

Let's begin by defining a few terms: SPL (Sound Pressure Level) is a measure of the relative loudness of sound. It's expressed in dB, or decibels. Normal conversation is around 60 dB. Loud music is about 90-100 dB. If you were standing on the runway when a jet airliner was taking off, that would be in excess of 140 dB. (See figure 1)

Most movies in a theater have peak SPLs during crashes and explosions of around 100-105 dB. That's very loud, and it's louder than most people want in their homes.

Now, let's define what engineers refer to as "speaker sensitivity," also known as "efficiency." This specification tells you how much power a speaker needs to play at a given loudness level. It's typically measured as "xx dB, 1 watt @ 1 meter on axis." That means a test signal is fed into the speaker at a 1 watt power level, and the speaker's output is measured (in dB) from a distance of about 3 feet away, directly in front of the speaker. Most speakers of average

efficiency will have a sensitivity of around 85-95 dB under these test conditions. Another factoid: every 3 dB increase in SPL requires double the wattage.

Assuming a normal-sized room (about 2000-2500 cubic feet, as measured by H x W x L), a good surround-sound receiver of 75-100 watts per channel can easily power speakers of average efficiency to peak SPLs past 100 dB. A larger room or less efficient speakers will require more power.

More important than the raw power number, however, is the quality of the amplifier. Some receivers work better with lower impedance speakers and it's quite common for two receivers with the "same" power rating on paper to sound quite different in the real world. Seek out receivers that brag about their high current capacity and low-impedance drive capability. Do your homework and use good electronics. You—and your speakers—will be much happier in the long run. (See figure 2)

### Other Tech Tips:

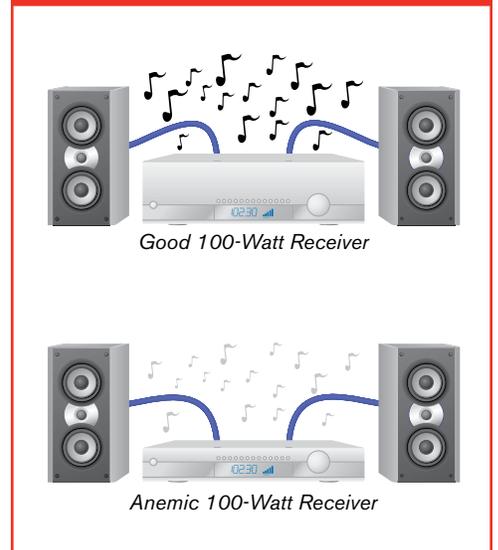
- Tip 20: Surround without Speakers
- Tip 21: Always set to small
- Tip 22: Difference from 6200 to 6200e
- Tip 23: The Devil's in the Details

Figure 1 How Loud Things Are



Life goes from soft to loud

Figure 2 Not All Watts Are the Same



Feed your speakers Good Watts!