

Setting Your System Speaker Levels Using a Sound Pressure Level Meter or App - Part 2



Begin here only if you've just read (or re-read) Issue 3 of this series and performed the preliminary steps described therein. What follows are the steps you'll take to do a manual system setup using an SPL meter or app. See the Supplement ([click here](#)) if you don't have such a device.

We know there's a lot of information in what follows. **Please take the time to carefully read each instruction before you perform the action.** You'll be rewarded with excellent system performance if you do.

Ready... set... begin...

The information below is provided with limited explanation for clarity and brevity. If you have questions concerning any of it, please email us at info@goldenear.com.

1. OK. You've already performed the preliminary steps described in Issue 3. BEFORE YOU BEGIN ANY TESTING BE SURE THAT ALL SOURCES ARE TURNED OFF SO NOTHING WILL PLAY THROUGH THE SPEAKERS EXCEPT THE TEST TONE.
2. Turn the Master volume control on the receiver/processor all the way down (It's usually that really big knob all the way to the right or left of the front panel. You know, the one your significant other is typically pleading with you to lower while Arnold Schwarzenegger is blowing up an entire city block.) and go to your receiver/processor's setup menu and find the speaker level calibration menu. Turn on the speaker setup test tone. If you hear the test tone coming from one of the system speakers, turn it back off and skip the next step.
3. Assuming you didn't hear the test tone with the Master volume set all the way down, shut off the test tone and set the Master volume control as follows: If the master volume control reads from "minus XX dB" through "0 dB" and then to "plus XX dB" (e.g. -60dB, through 0dB to + 15dB) set the Master volume control at 0 dB. If the Master volume control reads from "minus XX dB" and stops at "0 dB" set the Master volume at "minus 15 dB" (e.g. -60dB to 0dB, set to -15dB). If the Master volume control reads from an arbitrary minus number and tops out at another arbitrary number (e.g. 0 to 100), set the master volume at --20 (80). This should cover the vast majority of receivers and pre-pros on the market. If yours is different, throw it in the trash and buy a new one. OK, just kidding. Check your unit's owner's manual for test tone/level setting instructions.
4. Sit in the primary listening position with the SPL meter (or Apple/Android device running an SPL application) in hand. Turn on the SPL meter or application and set it to the 70 or 80 dB scale. If the meter you're using only has a pointer and not a digital readout, determine where 75 dB is on the scale you've chosen. See the example photo below.
5. Set the meter/app to "C weighting" and "Slow" or "Average" response as opposed to "Peak" or "Instant".
6. Sit back in your chair, hold the meter/microphone a foot or two in front of your body, aimed almost straight up and turn on the test tone. NOTE: The test tone can be fairly loud so be prepared and be sure your housemates know what you're doing. This is definitely not a 3 o'clock in the morning activity.

Most electronics start the test tone in the left front speaker. Many will leave it there as you adjust the levels until you touch the button on the remote control that moves it to the next speaker (usually the Center channel). Some units will start the test tone in a channel, wait a few seconds for you to make a level adjustment and then cycle to the next channel. If you don't make any level adjustments in the preset waiting time the unit will cycle to the next channel. If this happens *don't panic*. The signal will simply cycle through all the speakers in sequence and start over again. While you're actually adjusting the level on a channel, the test tone will stay on that channel until there's no activity for a given period of time. In either type of system setup, your goal is to set all the speakers in the system to 75 dB at the prime listening position.



This analogue SPL meter's scale reads from minus dB through 0 dB to plus dB. On whatever scale you've set, when the needle points to 0 dB, the meter's reading that SPL level. For example, set to the 80 dB scale, the meter is reading 80 dB when the needle points to 0 dB.

DON'T USE THE MASTER VOLUME CONTROL TO ADJUST EACH CHANNEL. Typically the Up / Down / Left / Right arrow buttons surrounding the Set / Enter / Select / OK button on the remote control are the ones that control moving from channel to channel (unless the unit sequences automatically as noted above) and setting individual channel levels up or down during setup. (Consult your owner's manual if you have trouble figuring out which buttons control these functions.) Take your time and measure each channel more than once. While you're measuring the meter may fluctuate a bit and you may not be able to get every speaker to measure precisely 75 dB (*See footnote below about sub level setting). That's OK, just get them as close as you can to all measuring the same and as close to 75 dB as possible.

7. When you're done, exit the setup menu, fire up the rest of the system and give it a listen. If it was never properly adjusted there will be a significant difference in the overall balance and localization of sounds. In particular, pay attention to dialogue clarity and positioning, surround involvement and bass quantity and impact. Please listen to several different soundtracks and music recordings over at least a week before deciding if you're OK with this balance.



8. After the system's set up, in theory you would be listening to movie soundtracks with the Master volume set to the position at which you ran the test tone. However, in all but the largest rooms or with the least efficient speakers, this level will probably be too loud for comfort (not to mention domestic tranquility). It's perfectly acceptable to reduce the Master volume control to whatever level you wish when using the system. The system balance from speaker to speaker will remain as you set it (but you may find it necessary to add a bit more subwoofer at lower volume levels, to compensate for our ears' lack of bass sensitivity at low volumes - see the bass footnote below).

9. You may find the following tweaks gratifying:

- If you set the Center Channel about 1-2 dB higher than the other channels (76-77 dB) dialogue will be more firmly centered on the screen and the front Left / Right sound field (width) will be reduced slightly.
- If you set the L / R front speakers about 1-2 dB high (76-77 dB) and leave the Center channel at 75 dB, dialogue will be slightly less anchored at the center of the screen but you'll get a wider front sound stage.
- If the primary surrounds in a 5.1 system are placed in the back of the room as opposed to the sides, they may need to be set 2 - 3 dB higher (77 - 78 dB) for a reasonable balance.
- Movie/TV special effects will most likely be more gratifying with the subwoofer set 2 - 3 dB high (77-78 dB). *See additional bass footnote below. Many people find that setting the subwoofer back down to the reference level of 75 dB is more balanced with music.

If you're using the **Aon's** or **Triton Seven's** you can try setting them to Large and evaluating the results. But note that in most cases you can get better bass performance (less stress on the speakers and your receiver/amplifier, better dynamics, more accurate reproduction) by assigning the deep bass to a separate powered subwoofer; a speaker designed, built and hopefully located in the room to maximize its bass performance.

What's the deal with Audyssey and other EQ systems?

This is a topic for another newsletter article, but if your electronics includes Audyssey or some subwoofer/room EQ capability, you should certainly follow the instructions and evaluate the result. We always suggest doing manual setup first and listening to the results for sometime before running any type of EQ, so that an informed comparison can be made. And make sure you know how to defeat or turn-off the EQ once run, in case you do not like the results. Because of the effects of rooms on low frequencies, subwoofer (or low frequency) room EQ can be most beneficial, when properly applied.

GoldenEar Technology assumes no responsibility for the results of using this setup procedure. Please use care, follow the instructions precisely and above all use common sense when setting up your system.

*Bass Footnote:

Measuring Sub Level: Many SPL meters don't have linear response at low frequencies (meaning they'll read lower than they should for the deep bass). Some meters come with data indicating the magnitude of this effect, but keep in mind setting 75 dB for the sub may actually result in too little bass response. Should this be the case, adjust the bass up several dB (4 - 6 dB) keeping in mind the goal is a realistic balance of bass, mids and highs.