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Subject: SPL meter confusion (long)

Posted by [newsjeff](#) on Fri, 19 Dec 2003 03:02:25 GMT

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I was playing around with my Radio Shack SPL meter today. I was measuring the sound in my home theater, using only the front speakers and a sub. The meter was set at 80db, C weighting, slow response. I used the Stereophile Test CD #3, tracks 17, 18 and 19. These tracks use 1/3 octave warble tones. Below are the results, with and without meter corrections done by Michael Sims of Prairie State Audio Construction Society. My numbers may not be that exact. This was actually a test before I examine my main listening room and main stereo. By the way, my home theater is 17X12 with 9 foot ceilings and hardwood floors. There are windows against my back wall (behind the TV and stereo) covered with curtains. The only furniture I have in the room is a couch. Needless to say, this is a very live room.

|            |             |              |             | Uncorrected |           | Corrected |    |
|------------|-------------|--------------|-------------|-------------|-----------|-----------|----|
| 76         | 83.5        | 25Hz         | 83          | 88 31.5Hz   | 81        | 84 40Hz   | 76 |
| 78.5 50Hz  | 73          | 74.563Hz     | 81          | 83 80Hz     | 86        |           |    |
| 88100Hz    | 87          | 89125Hz      | 85          | 85.5 160Hz  | 82        | 81.5200Hz |    |
| 82         | 79.5250Hz   | 80           | 84.5315Hz   | 84          | 82.5400Hz | 84        |    |
| 84500Hz    | 84          | 83.5 630Hz   | 81          | 81800Hz     | 82        | 821khz    |    |
| 81         | 811.25Khz   | 80           | 80.5 1.6Khz | 81          | 81.52Khz  | 79        |    |
| 77.52.5Khz | 79          | 77.5 3.15Khz | 81          | 79.5 4Khz   | 82        | 80 5Khz   |    |
| 84         | 82.5 6.3Khz | 86           | 848Khz      | 79          | 87 10Khz  | -         |    |
| -12.5Khz   | -           | -16Khz       | -           | -20Khz      | -         | -         |    |

If you graph the numbers, there is a peak at 25Hz, a dip at 50 Hz, and another peak at 6.3Kh. A dip starts at 8Khz and continues down and off the scale from 10Khz to 20Khz. Can anyone tells me what these numbers mean? Is it normal for speakers to fall off at 8Khz on? The only room treatments I am considering are Risch DIY tube traps and HF panels. Will these help? Any suggestions would be greatly appreciated. Thanks.

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Subject: Re: SPL meter confusion (long)

Posted by [Adrian Mack](#) on Fri, 26 Dec 2003 08:11:23 GMT

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Hi there, You need to take it outdoors and do measurements. Indoors, reflections and stuff are completely wrecking your measurements. Move the microphone even half an inch in another direction, and you could get a completely different frequency response. Take 'em all outdoors and do measurements there, and make sure its far away from any surrounding walls to avoid reflections which will ruin your measurements. Instead of using test tones and then measuring the SPL, a much more accurate way I'd recommend to measure the frequency response of your system is to use a computer based program. Speakerworkshop is a program which runs on the computer and takes a number of various acoustical measurements including the freq response which you want to do. You can use your RS meter with speakerworkshop, just hook it up with the loop back cable to your sound card. Make sure your sound card supports the full functions in Speakerworkshop though, theres a test option in the program to test your sound card for compatibility. [www.speakerworkshop.com](http://www.speakerworkshop.com) A large rolloff above 8KHz isn't "normal". It means

theres a huge lack of the very highest frequencies, like cymbals and stuff. It should be very noticable when you listen to a system with the major HF rolloff and then one which doesn't. What sort of speakers are you using? Have you also upgraded the mic in the RS meter to one which is flat? The mic in the RS meter actually has a huge rolloff above the same frequency which you noticed the big rolloff. Get the Panasonic WM-60AY from Digikey. Its about 2 bucks + shipping and linear right throughout the entire audio spectrum. I'd also recommend putting the mic on the end of an external rod, so you can move the microphone around while having the meter separate from it, as having your body near it introduces reflections too. It also makes it easier to use, so you can have the microphone placed way away and hold the meter in your hand and read it easily. See <http://www.gti.net/wallin/audio/rsmeter/33-2050/33-2050.html> for this microphone modification. Adrian

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Subject: DIY Microphone Boom

Posted by [Wayne Parham](#) on Fri, 26 Dec 2003 15:26:28 GMT

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You can make a nice little measurement boom with an inexpensive plastic tube available at most hardware and plumbing supply stores. The tube used for plumbing the cold water supply to a toilet is available in plastic, and it's the perfect size for fitting the Panasonic condensor microphones, including the WM-60AY. These tubes are about 20" (1/2 meter) long and work very well for this purpose. You can pick them up at just about any hardware supply store. The capsule can be pressed in and it fits in snugly. Run a shielded microphone cable up through the tube and solder it to the tabs on the microphone so that the solder joints do not extend wider than the diameter of the capsule. Press the microphone down into the tube a little bit so that it is held firmly. This makes a neat little measurement boom. One end is the microphone and boom, and the other end is shielded cable to RCA plug.

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Subject: Re: DIY Microphone Boom

Posted by [martinleewin](#) on Thu, 01 Jul 2004 17:28:53 GMT

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Adrian & Wayne, I checked the Panasonic web site for this product line. They are discontinuing all of the wideband omnidirectional models! I will see if DigiKey still has stock. All electret condenser mics I have seen require a phantom DC supply. The apps note schematic, [http://www.panasonic.com/industrial/components/pdf/em16\\_microphone%20schematic\\_dne.pdf](http://www.panasonic.com/industrial/components/pdf/em16_microphone%20schematic_dne.pdf), does show a 2VDC supply and load resistor needing to be hooked up. Is this the arrangement you use? Not a major thing, but I would need to build or buy a phantom power unit since my preamp does not supply any. It does make it more than a \$2 item by then. Just wondering if the equipment you use has phantom power that is compatible? Especially since many phantom power mic inputs exceed the 10V max for this device. Martin W.

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Subject: Re: DIY Microphone Boom

Posted by [Wayne Parham](#) on Thu, 01 Jul 2004 18:16:43 GMT

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The preamp I use is shown on the post called "Microphone Preamp." It is inexpensive and works well, easy to build and provides power for the microphone.

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Subject: Re: DIY Microphone Boom

Posted by [martinleewin](#) on Fri, 02 Jul 2004 14:40:38 GMT

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Thanx Wayne, That answers the Panasonic question well. I will build a phantom power box to go between this and a SWR California Blonde (acoustic guitar amp) used as a portable powered monitor for room testing in the field. It is handy as a wideband preamp/amp/2-way speaker and has a completely separate mic channel used for RTA pickup. Only thing lacking is that phantom power. The Panasonic mic and phantom will still cost less than an RTA mic like the dbx. And it is more fulfilling to build it yourself. Martin W.

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