Subject: Measuring sensitivity
Posted by JLapaire on Thu, 03 Mar 2005 18:37:12 GMT
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I can measure sensitivity at a certain frequency by setting drive voltage at, say, 2.83v and reading the SPL meter at 1 meter distance, but can't seem to get the DVM to settle with pink noise.I use TruRTA for tuning, but mistrust the sensitivity readings because there seems to be a big difference in drive between sine and pink, and I can't check it with the DVM. Am I missing the boat somewhere?Thanks,John

Subject: going way out on a limb here...
Posted by wunhuanglo on Thu, 03 Mar 2005 22:44:21 GMT
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the dvm probably measures rms ac voltage. the accuracy of that measurment decreases with frequency. at 60 hz rms voltage is [2^0.5]/2 of the peak voltage. i think your 2.83v is really 2.83/0.707 peak voltswith pink noise (equal power in each octave?) you've got a bunch of frequencies, not a single sine wave, so i can't begin to guess how the rms value relates there.just a little rambling from what little i think i know ;-^

Subject: Re: going way out on a limb here...
Posted by footstony on Fri, 04 Mar 2005 01:03:56 GMT
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Some DVM's have trouble with AC volts at higher frequencies. Some don't go over 1kHz, others may go over 1Mhz. Most will work well and are calibrated at lower frequencies around 50 or 60Hz in line with mains supply frequencies.You will need to check the spec.s for the meter.There may be an issue with how the meter derives the rms value. Some use "true rms" others use averaging which will not work for pink noise.Regards Philip

Subject: Re: going way out on a limb here...
Posted by Bill Fitzmaurice on Fri, 04 Mar 2005 02:13:27 GMT
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You won't get a stable reading with pink noise. The best way to use it is to take a few readings and average them. You also won't get the same dB reading with pink noise as you will with swept sine, as with pink noise the power is spread across the spectrum while with swept sine power is

all concentrated at one frequency at any one point in time. To derive SPL using pink noise you have to reference a single frequency within the plot to a reference SPL measured with sine at a single frequency. For a full range speaker 1kHz is the usual frequency of choice.

Subject: Re: Measuring sensitivity
Posted by DRC on Sun, 06 Mar 2005 21:59:27 GMT
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Being not at all helpful, but extremely nosy . . . What are you tuning? Something tasty that might make the Spring New England Valve (Bot) Do? I hope, I hope . . . .

Subject: Re: going way out on a limb here...
Posted by JLapaire on Mon, 07 Mar 2005 11:57:06 GMT
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Let's see if I've got this right: TruRTA has a sine generator, which I'd set to 1kHz, adjust level for 2.83vac (assuming 8 ohm) across the speaker terminals, then read dB spl at same settings with pink noise?I tried something like that before, at 60hz, and noticed that if I read 108db with sine, pink noise would be maybe 100 or less. I think I was seeing what you said I should see.What I'm trying to do is be able to answer honestly when someone asks what the sensitivity of my speakers is. In the above case, would it be 108 or 100?Thanks, John

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Subject: Re: Measuring sensitivity
Posted by JLapaire on Mon, 07 Mar 2005 12:30:41 GMT
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Hi Dave, I've had a bunch of projects scurry through the shop this winter. The big one was working with FreddyI's design for a Karlson slightly smaller than mine, but with an 18" instead of 15" driver. I shipped the test mule to him, so won't have it for the Do, but might modify mine with the knowledge gained. I'll start Shane's K15s this month; they'll definitely have the mods which should produce very slightly deeper base and an audible improvement in midbass and lower mid tonal accuracy.How 'bout you Dave - cookin' anything up to spring on us?

Subject: Re: Measuring sensitivity
Posted by DRC on Mon, 07 Mar 2005 13:08:35 GMT

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That sounds very cool. I remember your Karlsons volunteering to tear down my Glastonbury shop two years ago!I've got two definites, a maybe and a wild card:The easy definite is that I'm going to tweak one of my AN Kit 4 amps to see how far it will go. The other definite is that I'm building the AN Kit Preamp, and I'll try hard NOT to tweak the hell out of it so it remains a $729 full function pre w/phono, rather than double that with killer caps, resistors and wire.The maybe is an iron-rich, scratch-built 2A3 stereo amp with AN chokes, OPTs and interstage xfrmrs. I have the schematic, contemplating parts choices and I will build it; I just don't know it will be done for the Spring meet.The wild card is that I've been thinking of building a pair of speakers - everything from a Fostex back horn to Diatones to revisiting my TAD/JBL/TAD beasts using Bill Martinelli's 22" horn & 2" compression driver and eliminating the JBL mid. The whole thing is crazy since I'm up to my keister in speakers to begin with. Then again, the same is true of preamps and amps. Timing will be interesting since I've committed to doing the Great Plains Audio Fest and I want to do the Bot Do, which will be within weeks of each other - late April - Early May-ish.I've just got the build bug. I think I'm going to introduce my son, who turns 12 this week, to the joys of building stuff. I'll ask my daughter, too. She actually learned to solder in a science class in middle school last year. She's probably too busy being an angst-ridden yet aloof teen to be bothered with it, but I'll ask anyway.

Subject: Re: going way out on a limb here...
Posted by Wayne Parham on Tue, 08 Mar 2005 03:11:05 GMT
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That's the way I'd do it. I was going to write something like that yesterday or the day before in a reply to you but then backed out. I started going on about calibrations and references and then found I was no help at all. But if you could generate a sine wave from a source and then reasonably assume that the levels were maintained when generating white or pink noise, then at least you would know you were close.What are you doing to set a reference for your microphone level? And are you measuring a meter away from the baffle, the dust cap, the horn mouth or diaphragm? Or are you going far away and then calculating back to get the W/M value?

Subject: Reference distance
Posted by JLapaire on Tue, 08 Mar 2005 11:59:32 GMT
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That's a good question. When I do a reflex, I measure from the front suspension plane of the driver, as if it were a flat piston. Horns and Karlsons I measure from the front of the box. Not very consistent, is it? Lately I've been measuring at 4 meters just because Karlsons don't converge up close, and I don't imagine a reflex does either, even when doing just one driver. I've had the most luck with ground plane, especially indoors, and I've learned to leave the unfixable room anomalies alone, rather than try to take them out with parametric EQ. All of my graphs show a high-Q

suckout at 62hz and a broader hump at 160hz even after throwing rolls of insulation, pillows, futon, and a mattress around. Heck with it, it's there. The best place for measuring in my house is the living/dining area that opens to an upper level, so there are the usual constraints on how long I can leave a rig set up.You mentioned reasonably assuming the level is unchanged when going to pink noise from sine - I agree, but it's kind of a leap of faith that I'm not willing to take without corroboration, and is really what started this. TruRTA has a calibration routine, but I don't like the way it works - the graphs don't match my SPL meter.

Subject: Re: Reference distance
Posted by Bill Fitzmaurice on Tue, 08 Mar 2005 19:12:23 GMT
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Pink noise measuring 6 to 9dB lower than sine is about right, as your source has its power spread across the spectrum. I usually measure at 2 meters to minimize multipathing and then add 6dB to get the 1 meter rsult.
