Subject: Distortion Measurements
Posted by Wayne Parham on Sun, 21 Oct 2007 17:56:18 GMT
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The way we measured distortion is to filter out the fundamental and capture sound in the first two octaves above the fundamental. This gets mostly the second and third harmonic plus any noise present in that band. Since distortion harmonics from subwoofers (especially basshorns) are primarily second and third, this is a pretty good indication of THD+N. We measured amplitude response and distortion at 28.3v, 100 watts, 200 watts, 400 watts, 800 watts, and so on up to 1600 watts or the maximum allowed by the owner of the cabinet. The distance was 10 meters, so add 20dB to get the value at 1 meter. Each response chart shows SPL as a blue line and THD+N distortion as a violet line. To know the amount of distortion present, simply subtract the distortion from the SPL to read a decibel value, -35dB, for example.Then to convert to a percentage, use the following conversion chart:-60dB = 0.1%-55dB = 0.2%-50dB = 0.3%-45dB = 0.5%-40dB = 1%-35dB = 2%-30dB = 3%-25dB = 5%-20dB = 10%-15dB = 15%-10dB = 30%-5dB = 55%If the distortion level falls below the line shown in the noise floor measurement, then distortion is unknown. One can only know it is below the noise floor, approximately 65-70dB. Typical amplitude response ranged from 105dB to 120dB, so the average dynamic range was approximately 40dB. That means distortion below about 1% was too low to measure with this setup. To get more resolution, we could have moved the microphone closer but since we were primarily concerned with high power levels, 1% resolution was sufficient.