

---

Subject: Re: Turntable Cartridge Measurements

Posted by [Wayne Parham](#) on Tue, 09 Jul 2019 02:22:38 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

Observations:

There is evidence of harmonics in some of these measurements. I'm confident that the amplitude of the fundamental is still accurate because I initially measured in oscilloscope view and saw that the fundamental wasn't clipped. So if that information is all that is needed, then the presence of these harmonics isn't important. But sometimes - like distortion measurements - harmonics are an indication of some sort of nonlinearity, and that makes me less confident in the IMD measurements.

What I don't yet know is whether the harmonics were caused by a sampling artifact or by something like clipping in the phono stage or in the measurement amplifier. I am most suspicious of the measurement amplifier and ADC, because the phono stage was not operated beyond its limits. It was used as it normally would be. The measurement amplifier/DAC used was a Behringer UMC202HD, and it has variable gain controls. I could have simply set those too high.

The frequency counter seems off in some measurements. When Daqarta is in spectrum view mode, the horizontal scale is linear with lines every 2kHz. So it is easy to read what frequency is presented from the horizontal position. In some cases, the position indicates a frequency that is different from what the counter reads. An example is the stepped sine sweep where the frequency counter reads 14121.248. The position indicates the frequency of that measurement was closer to 18kHz.

The frequency counter errors could have been a result from the harmonics. When there is more than one sine wave present, a frequency counter cannot really know what to count. So the multiple frequencies from harmonics may throw off the counter. Or it may have been that there was too much noise, or the frequency counter may just not be all that accurate. It did seem to work well when presented with a clear single sine though.