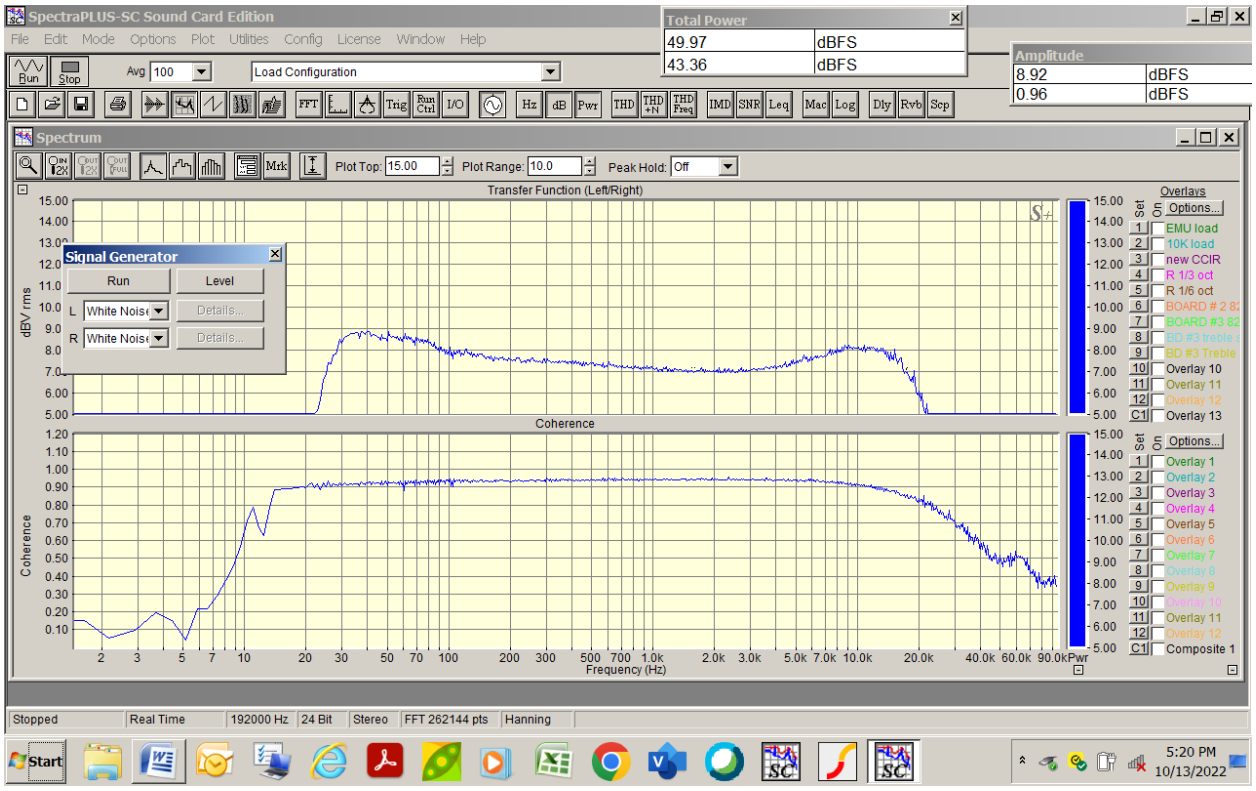
NextGen A80R/C Record + Repro Cards:

Transfer Response/Coherence Function/Impulse Response, and Excess Group Delay; SM900 tape, 15ips CCIR

OR

How NextGen designs for and confirms absolute Sonic Accuracy in Tape Electronics



Complex Transfer Function magnitude (obtained from cross spectrum using white noise stimulus recorded/reproduced at approximately 10 dB below 350nWb/m) **on Top Trace**;

Coherence Function on Bottom Trace is as much as 0.96, indicating essentially 96% correlation between power per unit Hz of input and output. What this indicates is exceptionally good linearity, conformance, and output predictability to input 20Hz to 20Khz; the difference from perfect 1.0 at this level is due largely to residual noise (including Bias Noise crosstalk from the non-recorded track) rather than non-linearity.

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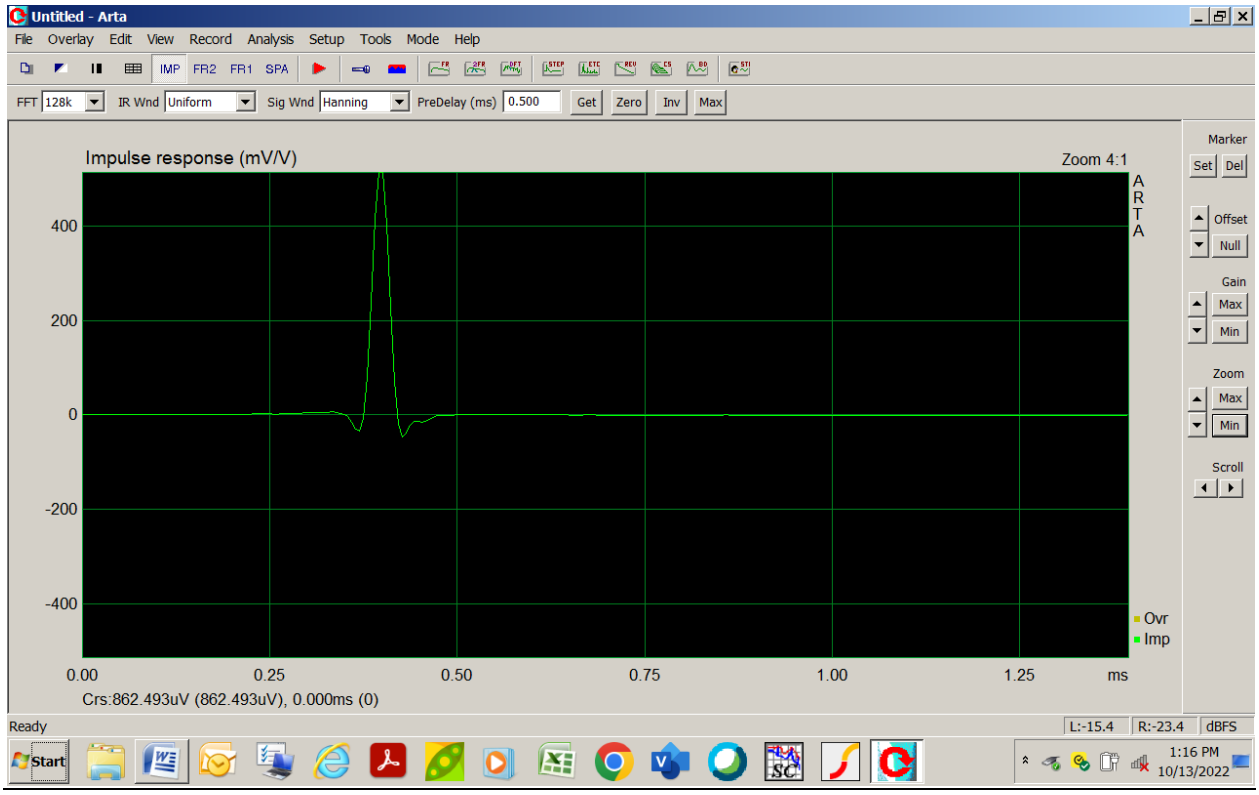
Thanks to slight rise in Bass response below 100 Hz of about 0.5dB, Indicates 2.0 dB peak-peak error from 25Hz to 20 Khz; with small bass adjustment on repro card could indicate 1dB peak-peak error 30 Hz - 18Khz.



<u>Calculated Impulse Response from computed Transfer Function (</u>FFT from averaged complex cross-spectrum of periodic pink-weighted noise) (Tape delay of approx 140ms removed between REC and REPRO heads at 15ips removed from the calculation).

The above indicates a near-perfect band-limited impulse response.

Highly Modified STOCK Studer REC and Repro Cards, UDXL Tape 15 ips NAB

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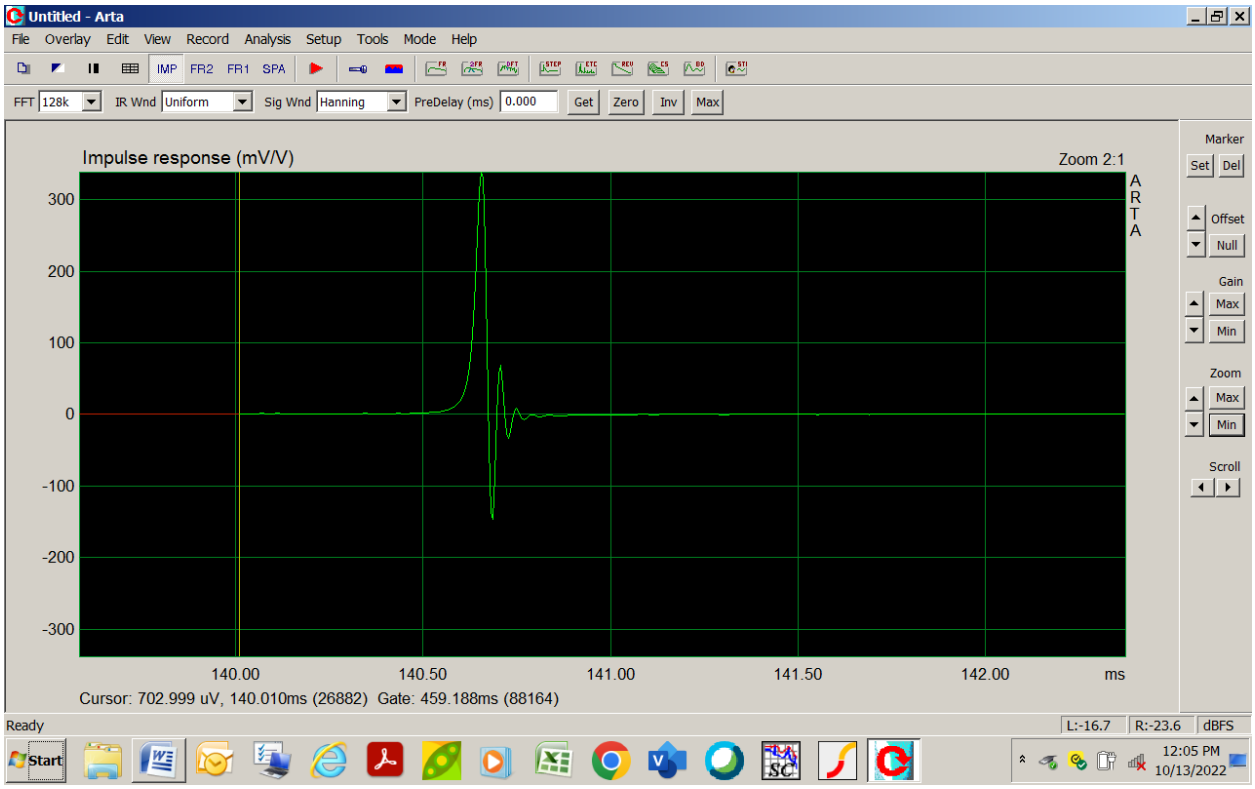

For comparison purposes, the Impulse Response of highly-modified Stock STUDER record and repro cards without however Group Delay Equalization made in the same machine; Note in particular the poor settling time and "ringing" of about an extra 160uS indicating excess Group Delay variation.

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Effect of Group Delay equalization: less than 500us peak-to-peak excess Group Delay achieved from 20 Hz to 20Khz, less than 300us peak-to-peak excess delay from 100 Hz - 20 Khz, and less than 100us excess delay from 1Khz - 20 Khz; this indicates exceptional NextGen transient- and time-domain response , confirming the NextGen previously-presented square wave measurements. (From complex FFT of impulse response above; 1/3 octave smoothing applied)

What this means: Group Delay near perfectly compensated (i.e. equalized) from below 200 Hz to limits of audibility, and well below perceptual thresholds for Group Delay distortion published by Zwicker and Feldkeller 1967, Fleischer 1977, Fleischer 1975, Blauert & Laws 1978.

As far as NextGen is aware, such measurements (Transfer Function/Impulse Response, Coherence function, and excess Group Delay) have never been previously published for analog magnetic tape recorders.

The results indicate unsurpassed time domain response accuracy, which translates to exceptional transients in particular (attacks and decays), and (along with the NextGen B-H linearizer greatly extending low distortion dynamic range) the sense of unlimited dynamic range. This in turn adds an impressive degree of musical authority and "correctness" on loudspeaker systems optimized for linear-phase response, especially in the first 10-20ms of non-reverberant "direct sound" from the loudspeakers, as well as headphones.

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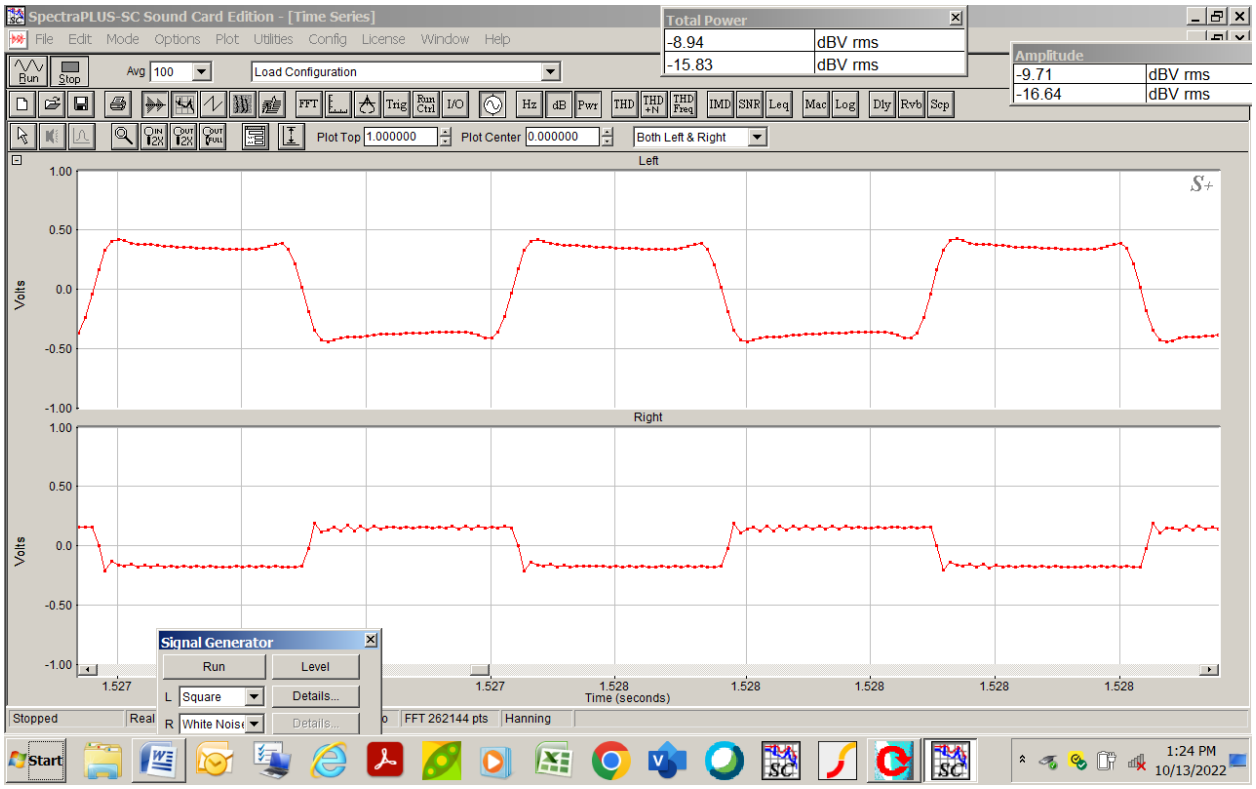
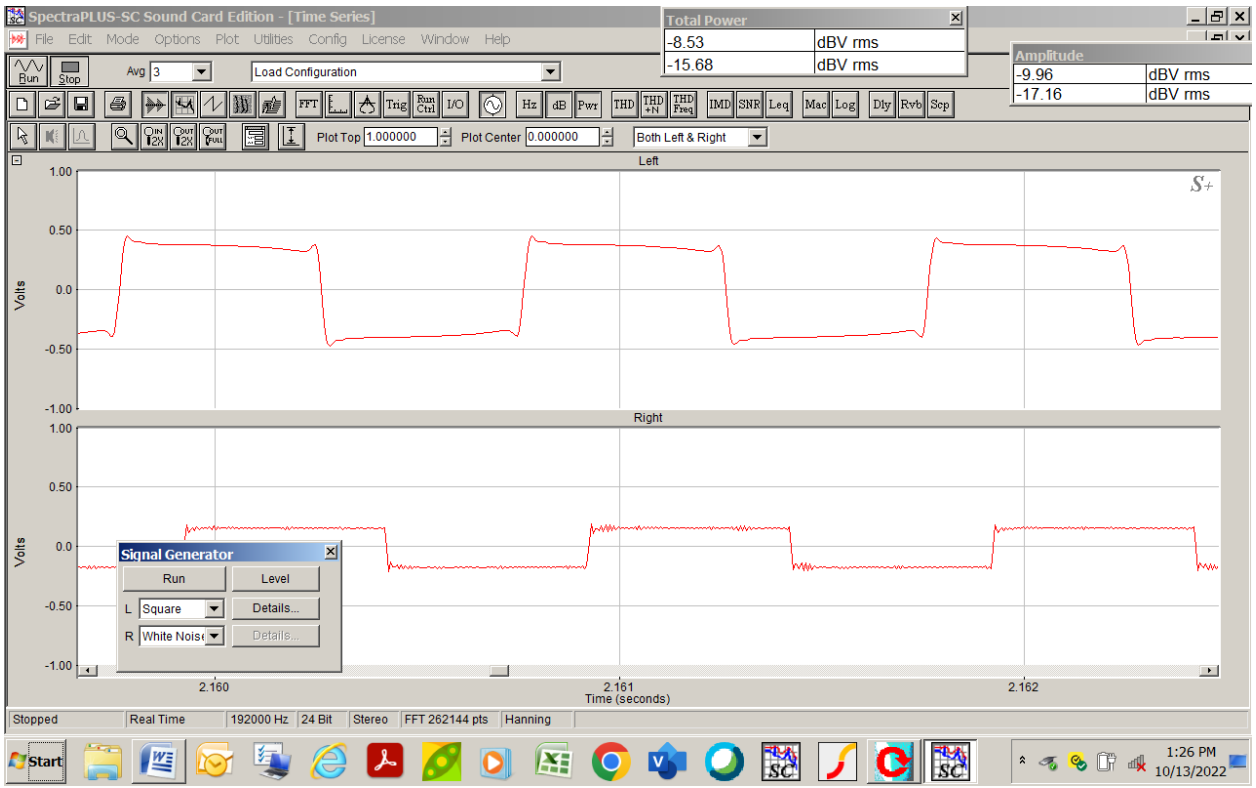


3 Khz wideband SW at approx -3dB re 350nWb/m



1Khz wideband SW at approx -3dB below 350nWb/m

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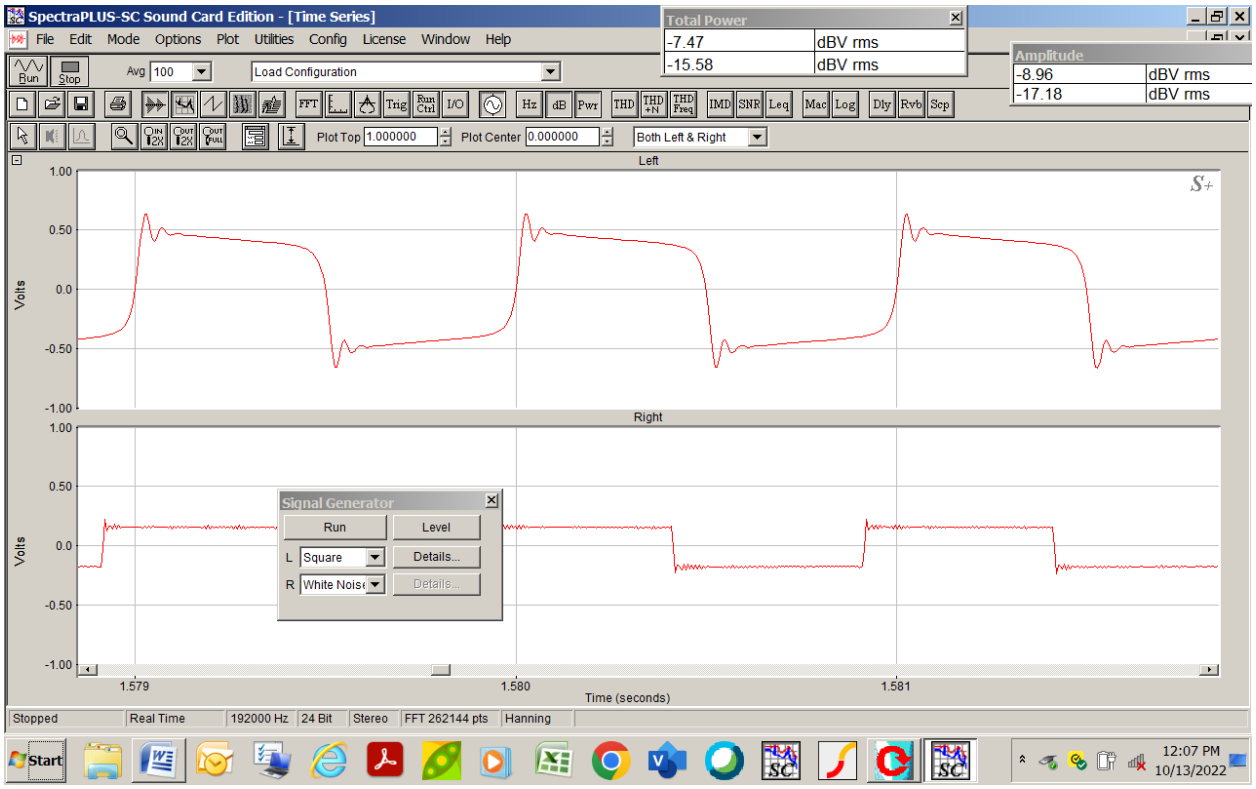
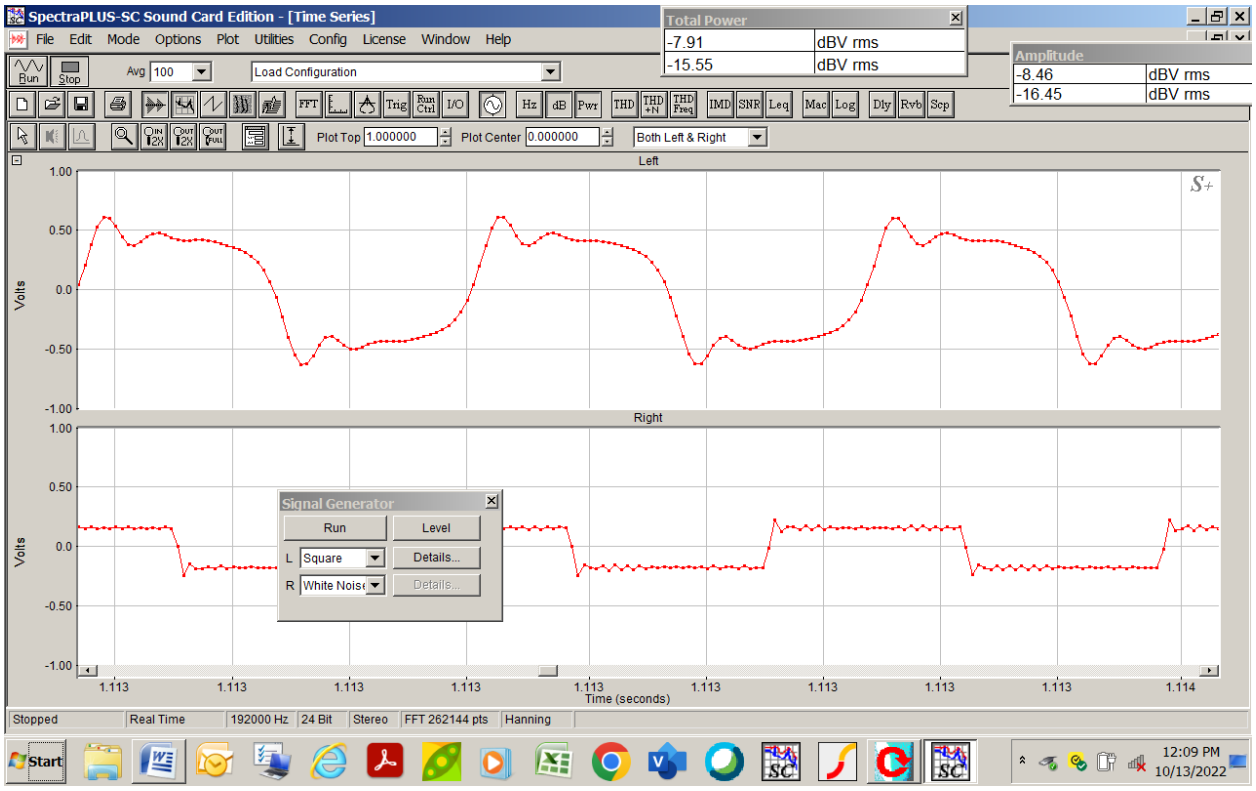


For comparison: Highly-modified Stock Studer A80Rc Record & Repro Cards: 1 Khz square wave approx -3 dB re 250nWb/m MAXELL UDXL tape above:, 3Khz square Wave below



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