

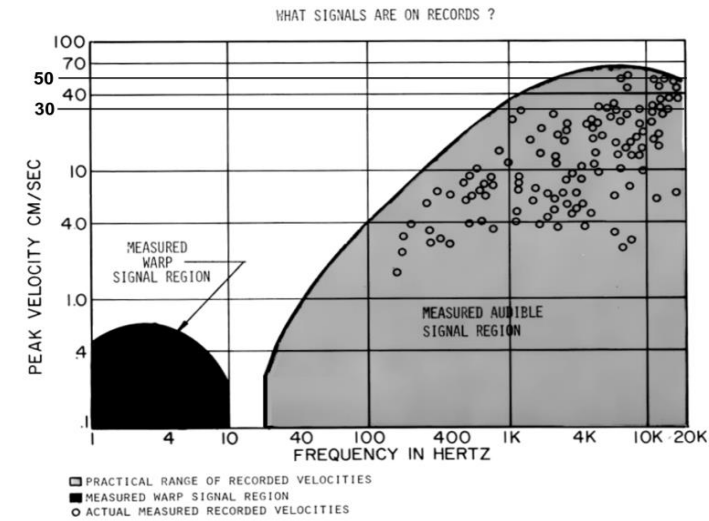
Maximum Phono Cartridge Output Supported

by Dave Dal Farra

Maximum groove velocity

http://www.pspatialaudio.com/max_velo.htm

"The data confirm maximum velocity almost never exceeds 50cm/s , and that these maximum values do appear around 8kHz just as the theory predicts"



"the situation is actually worse than the considerations above imply when we come to play the record, because a further limitation exists on reproduced velocity when the stylus radius dimension exceeds the radius of the recorded curve"

"a stylus with an effective radius of 5µm (as do the best hyper-ellipticals etc.), will keep ahead of the limitations due to cutting at all recorded radii."

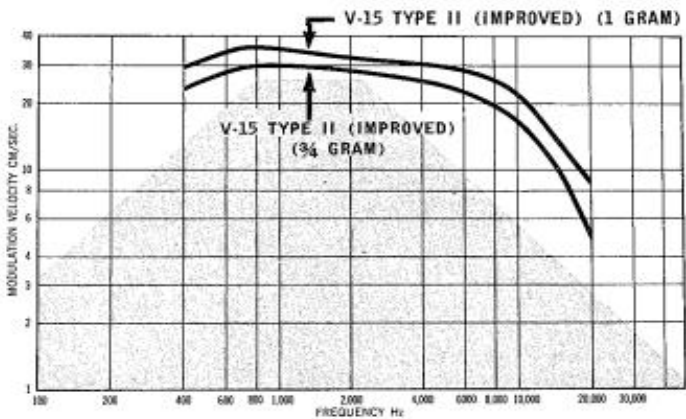
"no better argument could be advanced for the superiority of hyper-elliptical stylus and its cousins such as the Shibata"

"Thus we can say, the maximum recorded velocity on a 33⅓ RPM LP will never exceed 50cm/s, and even this figure is only achievable on the outermost groove"

"We can apply this rule to other media too. Thus, a 12" 45 single can support a maximum recorded velocity of 68cm/s (although measurements frequently indicate that recorded levels on 12" singles are no greater than from LPs*). "

Maximum theoretical limits: <https://pubs.shure.com/guide/TTR-101/en-US>

of total performance. The chart shows frequency across the bottom, and modulation velocities in CM/SEC up the side. The grey area represents the maximum theoretical limits for cutting recorded velocities; however, in actual practice many records are produced which exceed these theoretical limits. The smoother the curve of the individual cartridge being



<https://pubs.shure.com/guide/C-PEK-2/en-US>

"A stereo pickup in good condition should be able to track Band 10 or 14 cm/sec at the medianrecommended force"

Cartridge Sensitivity

Shure specs output as millivolts RMS, with sinusoidal groove modulation at 1000 Hz having a PEAK velocity of 5 cm/sec.

Stanton specs sensitivity in mV/cm/sec

Cartridge Sensitivity mV/cm/sec [Example, Stanton 881MkIIS: 1 mV/cm/sec]

Phono Preamp Gain Calculation

Phono Gain dB [Example Acurus P10: max input = 150mV @ 1kHz; Gain = 37/47/57 dB selectable; Maximum output = 8V]
[Solution: added headphone pre with volume control between phono pre and A/D]

Groove Velocity (cm/sec)	Phono Output (mV)	Phono Pre Output (mV)
14	14	991
28	28	1982
50	50	3540
68	68	4814

A/D Overload Calculation

A/D max input dBu [example: ESI U24-XL = +4.7]
1331 mV

Maximum groove velocity supported cm/sec