



By C.J. Huss

Chapter Seven

Straight Talk Part 2 or Skating On Thin Vinyl

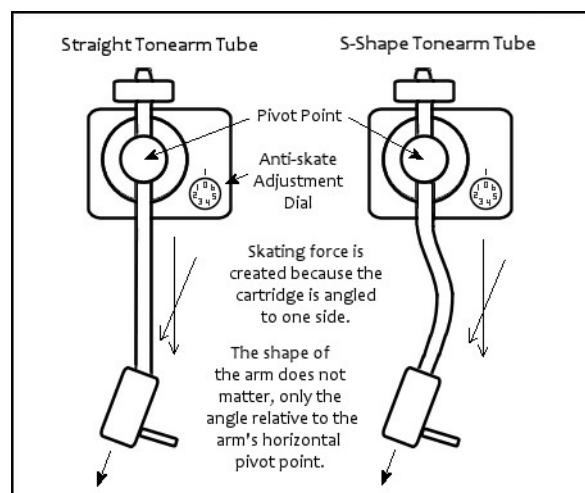
In last month's column, I finished things off with the possibly cryptic comment:

\*\*\* There is also one truly great advantage to linear-trackers that is often ignored, which is actually of much greater real-world benefit than the usual issue of perfect stylus alignment. What be this, pray tell?

*The lack of skating force, and so the lack of need for anti-skating compensation, a standard fixture on any decent pivoted tonearm.* So-- what is skating force? \*\*\*

What indeed! One of the most misunderstood characteristics of pivoted tonearms is the need for anti-skating compensation, usually represented by a little dial near the tonearm base calibrated with numbers that you are supposed to match to the cartridge tracking pressure, or a small weight hanging on a thread to one side of the arm bearing assembly.

What does this dial (or weight, or whatever) actually do, and why? A brief detour into some math and physics is needed here, but it's pretty simple math and physics. Unless you have a linear (straight-line) tracking type of turntable, the business end of your tonearm will be angled inward relative to the arm itself, or else the arm will be bent in an S-shape so that the cartridge is angled relative to the back of the arm.



As I detailed in the previous column, it is critical that the stylus be exactly in line with the record groove to the greatest possible extent as the record is played, in order to maximize the audio quality of the recording, especially for a stereo record.

But what happens as an inevitable mathematical/physical aspect of placing the cartridge holder at an angle is that when you are playing the record, the pulling force the record groove exerts on the stylus (and by extension, the cartridge and tonearm it's attached to) pulls not straight on the arm bearings, but at an angle to them. This off-center pull is what creates skating force.

So why is this a problem? Because while the force is small, so is the tracking pressure that keeps the stylus properly following the groove. A sideways pressure makes the stylus want to press harder against the inner groove wall than the outer one. This can cause mis-tracking of the audio (distortion), and over time will wear one side of the stylus more than the other, causing it to need replacement sooner than it otherwise would.

The anti-skating method your turntable uses attempts to add exactly the opposite amount of force to that created by the angled offset of the cartridge. Typically, for the dial-type of adjustment, the dial operates a small spring that tugs progressively harder on the arm as you increase the setting.

Why does the setting need to be adjustable? Because the amount of skating force the arm generates is directly related to the cartridge tracking pressure. The higher the tracking force—say, 3 grams instead of 2—the more friction the stylus tip creates in the record groove, and that means it pulls harder on the arm. The harder it pulls, the more skating force is generated.

Wait, you say, one thing is still puzzling me (okay, hopefully only one). Why is it called skating force? I've never seen any ice forming on any of my records, so...

Ahh, a perfectly valid question, my young apprentices. To see why, you need something that you might have to be a collector of very, very old recordings to have, like those 78 RPM discs that have music recorded on *only one side!* If you don't have such a critter, then imagine along with me. You put the disc on the turntable with the smooth, blank side up. You start the platter rotating, place the stylus down on the outer part, and—watch as the tonearm glides inward, *skating* over the blank surface. If you're by chance doing this for real, be careful. Even at a mere 33<sup>1/3</sup> speed, that arm can move surprisingly quickly, and the cartridge go right past the playing surface and scoot into the label area!

What's that, it didn't? It kind of stood still wherever you placed the cartridge, or maybe just very slowly moved in or out on the blank record surface?

Bet you didn't think to turn off the anti-skating on your tonearm first, didn't you? S'okay, I kinda forgot to mention you should turn it off first. Fear not. Try it, and... whoa, lookit that tonearm skate! Now, don't forget to put it back to where it was set before.

So, that's the basic scoop. Linear tracking tonearms don't have this problem because the force pulling on the tonearm from the stylus playing the groove is directly in line with the arm, so there is no sideways force generated. No sideways force, no anti-skate needed. But why is this an inherent advantage for

this type of arm? If the little dial or weight can compensate for the side-force error, what's the biggie?

The biggie is that the anti-skate compensation is inevitably *approximate*, because two other factors enter into how much force is generated, and you have little to no control over them. One is the music itself. The louder the music ("higher modulation level") in the groove, the more friction on the stylus, the more anti-skate compensation needed. But the music may be loud one minute and softer the next as the record plays, and the friction will vary with it.

Two, the shape of the stylus tip changes the friction. Conical, elliptical, hyper-elliptical, fine-line, micro-ridge, shibata—all present different degrees of friction relative to the groove. Some turntables do calibrate an anti-skate dial with different settings for different stylus tips, usually conical vs. elliptical, but these aren't common.

So how best to set your anti-skate for optimal audio quality and least stylus wear? 30 or 40 years ago, the answer was easy. You took your 'table to a reputable local audio dealer or service shop where a person intimately familiar with proper turntable setup would use test records, a cartridge analyzer and an oscilloscope to make all of the adjustments as objectively accurate as possible. Today, this is a dying art, known mostly by geezers who were "there at the time," and who still have the gear and test records needed.



### Music: It's all in what you grew up with

By Lou Vlangas

Let's go back to the day when we started to realize that music was starting to move us.

I remember listening to WCAO 68 AM in Baltimore. The Johnny Dark show was a popular one around town. If I close my eyes and think back, I can still hear his voice. I would be casually dancing down the street as I carried my six transistor radio—those were the days.

I noticed my taste was a little different as I became a teen. I loved Doo Wop and my friends all listened to Rock. I listened to WQSR oldies 105.7 FM in Baltimore and my friends listened to WKTK-FM, pure hard rock. It was at that time I decided to educate myself in all genres of music.

It's funny how our music taste changes over the years, however I think people tend to listen to what they grew up with as time goes on.

So, I'd like to hear from you. Send me an email and tell me your Music Story. I'd love to hear from everyone and your story could possibly be a part of a future Key-Notes.

Feel free to share your story with me at: [vinylab@comcast.net](mailto:vinylab@comcast.net)

Music: The soundtrack of our lives

Not available in your neck of the woods? Then the next best thing is to follow the directions in your turntable's user manual as to how to set the anti-skate. That may not be absolutely perfect, but it'll get you close enough to reasonable. By all means, please ignore those occasional voices/tweets/ramblings on the interwebs who tell you, you don't need anti-skating compensation. This is only true if your turntable is so old and has such a heavy, clunky arm with poor quality bearings that record damage from same is already much more than anti-skating can ever correct for. (Think of it like you're lying on the floor with a hundred pound sandbag on your chest. Someone nudging you in the ribs from one side isn't really helping you breathe any easier).

Also, unfortunately, using a blank record surface to set anti-skate is not reliable, despite insistence from some that it is. **It isn't.** Stylus shape, how smooth the blank surface is and other factors enter in. The biggest factor is that when this method is used, only the very bottom tip of the stylus touches the vinyl, and the friction is much less than when it's actually down in a groove, where the contact area is greater.

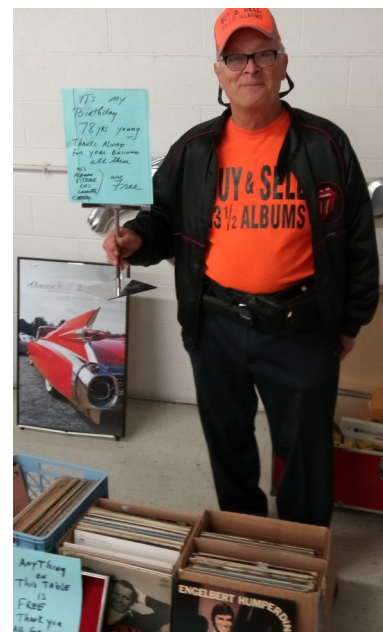
So-- user manual recommendations, or pro setup is the only reliable way to go. One final note-- the only truly definitive way to determine if your anti-skate is set correctly is to examine the stylus under a microscope once it gets worn, and see that the wear flats are even on both sides. If so, be sure to keep the same settings once you replace that worn stylus!

That's all for now, folks! Thanks again for reading these rambles, and hope they make your audio life a bit more informationally background-y! Take care, and...

... Happy Tunes!

-- CJ

### As Seen At the Fall Carlisle Car Show



Between our monthly **Pennsylvania Music Expos**, many of our vendors sell in other venues, including regular **Dennis Gothard**.

Eight weekends a year he has a record space at car shows at the Carlisle Fairgrounds.

This year on the occasion of his 78<sup>th</sup> birthday October 4, Dennis had an area full of free merchandise from records to car magazines and more. The sign he is holding thanks customers for support over the years.

Happy 78<sup>th</sup> Birthday Dennis! *Editor's Note: Your editor shares the same birthday, although at a lower number (a baker's dozen less!)*