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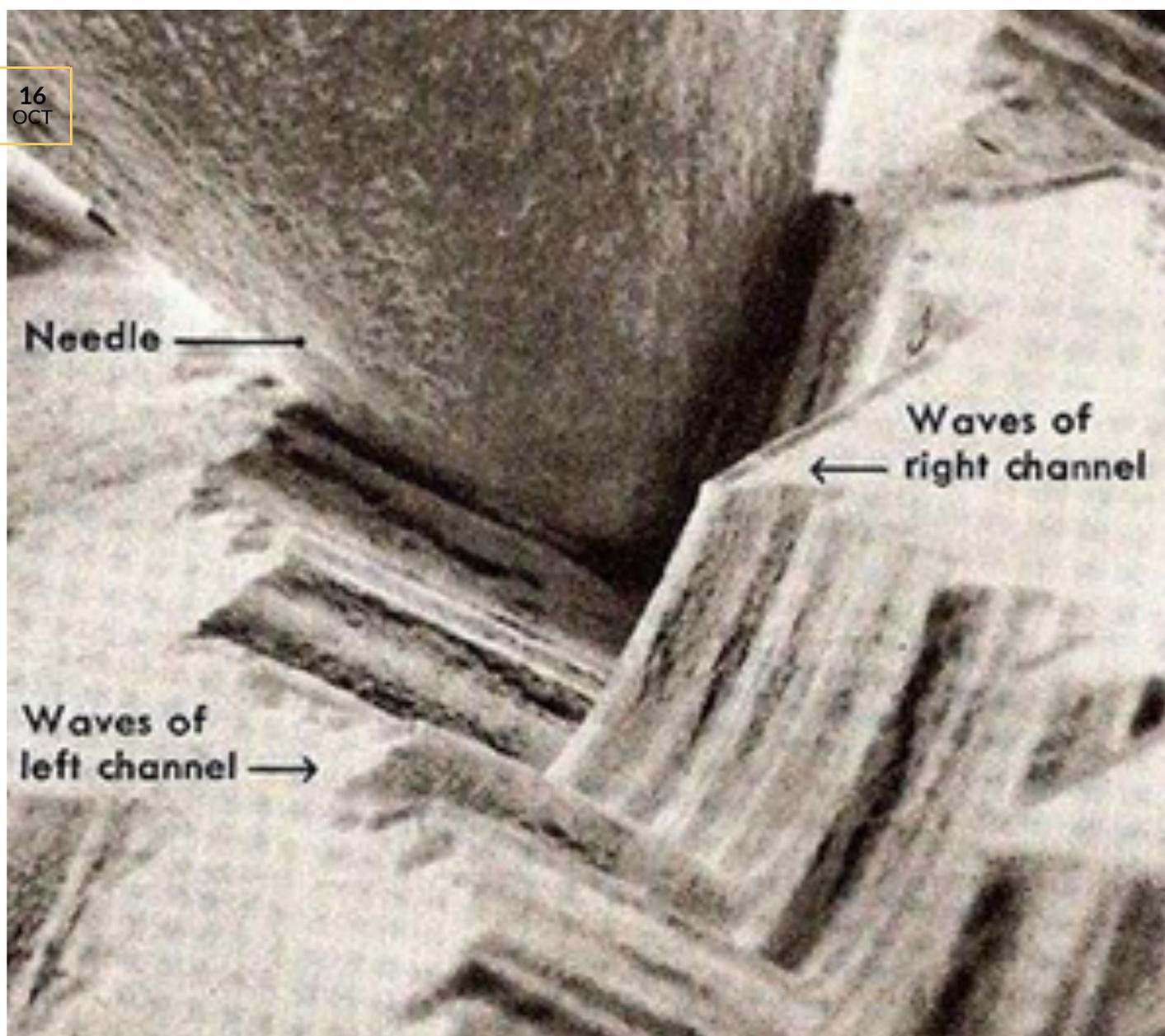


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## VINYL 101: The Turntable Cartridge And The Stylus

by [Michael Vanevenhoven \(http://vinyljunkies.co/author/michael/\)](http://vinyljunkies.co/author/michael/). Posted on [October 16, 2015 \(http://vinyljunkies.co/vinyl-101-turntable-cartridge-stylus/\)](http://vinyljunkies.co/vinyl-101-turntable-cartridge-stylus/)

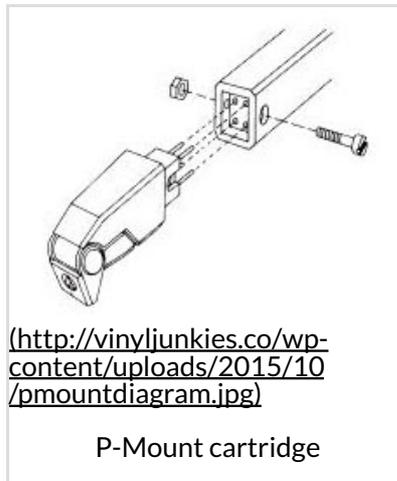
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There are many ways to improve the sound of your stereo system. Most of you are aware of the differences the right speakers, turntables and amps can make. Those who are new to audio may be less aware of the importance of the right turntable cartridge. The impact can be significant. Different cartridges have different sound signatures. Some are “bright” or “lively”, some are “warm” and some are “neutral”. There is no wrong choice. It’s about synergy. How well does the cartridge work with your tonearm and rest of your turntable? Your ears are the final and most important judge.

Another important and often overlooked part of the cartridge is the Stylus (or needle). Later in this article I will attempt to explain the differences between the three most common stylus shapes and how the right choice can improve your listening experience. First though, let’s take a look at the three main types of cartridges.

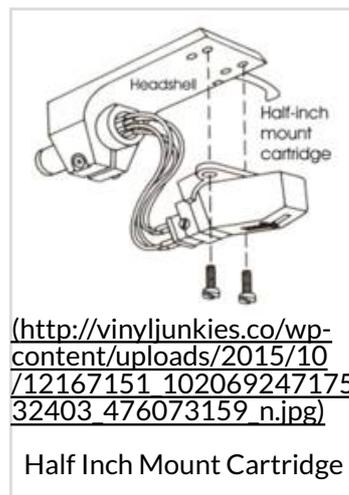
### The P-Mount Cartridge



P-mount cartridges “plug” into the end of tonearms designed to take them. Plug it in and set the weight to 1.25 grams. That’s it, you’re done. It’s that simple. There is no need to align the cartridge, adjust for overhang, azimuth or anything else. That’s the beauty of the P Mount. They are great for those who don’t know how or don’t care to calibrate a ½ cartridge. However, that convenience does come with a down side. Although there are some nice sounding P Mount cartridges, they will generally not sound as nice as a similarly priced standard mount cart. The end user will decide if the ease of the install is worth the downgrade in sound quality.

Replacement Styli and stylus upgrades are available.

### The Standard Half-inch Mount Cartridge



The two most common types of 1/2 inch cartridges are Moving Magnet and Moving Coil.

## The Moving Magnet Cartridge

Moving Magnet (or MM) cartridges are the most common. They require proper setup. Setting “null points”, VTA, tracking weight and so on, might seem daunting to the inexperienced but it’s less difficult than you might think. There is a wealth of information online. If the task is overwhelming, bring your table into a reputable stereo shop and have it set by a tech. A good MM cartridge, properly calibrated, will SING! Prices for MM cartridges can range from well under 100 USD to thousands. However, since the cartridge very rarely fails, the investment can last for decades. What can and does fail is the stylus but they are easily replaceable by the user. If you have an older cartridge that you absolutely love, it may be advisable to purchase several replacement styli for it. Cartridge manufactures can and do phase them out.

## The Moving Coil Cartridge

Moving Coil (or MC) cartridges have the advantage of lower mass. The lower mass means the stylus is able to trace the grooves more accurately and provide a more detailed sound. MC carts have better stereo imaging, transients and clarity. They also start at a higher price point. Because they have lower output than MM Cartridges they will require an amplifier or preamp that can handle the lower output. Like MM Cartridges, Moving Coil Cartridges require proper setup.

MC cartridges do not have user-replaceable styli, although some manufacturers do offer trade-ins.

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## Stylus Shapes

When replacing the stylus in a P-Mount or Moving Magnet Cartridge, an important consideration is the shape of the diamond itself. Although there are multiple variations, the three main shapes are Conical, Elliptical and Line Contact. I will be speaking in generalities here but let’s take a quick look at some of the differences.

### Conical Stylus

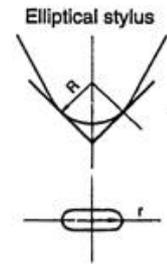
The Conical Stylus is the easiest to manufacture and is the most common. It has a spherical tip typically with a radius of 0.7 mil, which normally touches near the center of the record groove walls. They have the lowest level of fidelity because they can’t accurately retrieve small groove modulations. Because they are riding higher in the groove, the Conical Stylus does not reach the highest frequencies which reside in the deepest grooves.

Although record wear is a simple fact of life, the conical stylus will be somewhat more damaging than other types. This is because the conical stylus contacts the record in two small points on each side of the diamond. The entire tracking force is concentrated on those two spots, resulting in more record wear. Stylus types that contact more of the groove will lessen the force per square inch, thereby diminishing the possibility of groove damage. Conical tipped needles are best used when ruggedness and economy are the deciding factors.



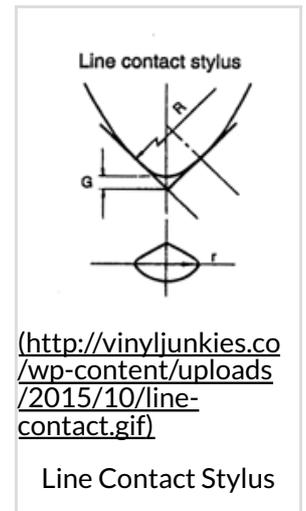
### Elliptical Stylus

The Elliptical Stylus (also called the bi-radial) has two radii, with the front being wider than the side radius. Elliptical styli are available in several sizes, such as 0.2 x 0.7 mil, 0.3 x 0.7 mil and 0.4 x 0.7 mil. The first number is the side radius. The smaller the side radius, the deeper it will ride in the grooves and the more potential it has to retrieve the information contained in those grooves. The Elliptical Stylus has a slightly greater vertical contact area than the Conical. In theory, this should result in less record wear because the tracking force is distributed over a larger area, resulting in less pressure per square inch. The Elliptical is able to track groove modulations better than a conical. It is better suited to recovering smaller high frequency groove modulations, and will have lower distortion. An Elliptical Stylus will provide a nice balance between musicality and price.



#### Line Contact Stylus

Developed in Japan in the discrete quadraphonic era, the Line Contact stylus (Shibata) is the closest in shape to the lathe cutter. When properly aligned the Line Contact will offer superior tracking and better high frequency response. There are many other advantages to the Line Contact. As you could guess by its name, the line contact touches the groove in a line from top to bottom unlike the conical or elliptical which touch the groove at two points. An advantage to this is it will not touch groove damage created by Conical and Elliptical styli. With my Line Contact, I have noticed a marked improvement in the sound of old groove damaged records. Besides being the highest resolving stylus type, the Line Contact is also the kindest to your record collection. It contacts nearly four times the surface area of other styli types resulting in far less record wear. Typically a stylus of this type will last longer as well. The downside to this of course, is the cost. They are not cheap. However, when I look at what I have invested in my record collection it seems to be a small price to pay.



One last thing...

Be aware that your tonearm will call for a cartridge with both mass and compliance with-in a certain range. Generally speaking, low mass cartridges should be paired with low mass arms, medium with medium, high with high. Also, it doesn't make much sense to put a 500 dollar cart on a hundred dollar table or conversely, a fifty dollar cart on a table worth thousands. As always, DO YOUR HOMEWORK and happy spinning!



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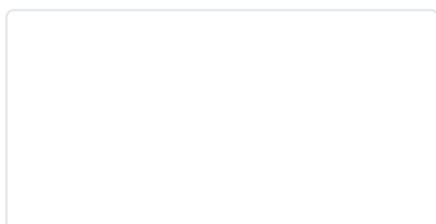
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