
Subject: Stylus Inspection

Posted by [Wayne Parham](#) on Thu, 13 Dec 2018 19:31:16 GMT

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All my life, I've replaced my turntable stylus when I "felt" it was time. I've just guessed about stylus quality, really. So there's no telling how bad I've let my needles get before swapping them.

I've decided to check the needles myself with a microscope. So I've ordered one and it should be here within the week. I understand that what I'm looking for are flat spots on each side, where the diamond contacts the groove.

I'll post photos of what I see. I have a couple brand-new needles, one that's elliptical and another that's shibata. I also have a couple of worn needles, again an elliptical and a shibata. So this will allow me to compare a new shape to a worn shape. Should be interesting!

Subject: Re: Stylus Inspection

Posted by [Rusty](#) on Thu, 13 Dec 2018 22:00:58 GMT

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I've never gotten to a point of replacing yet, based on assumed or otherwise need for new stylus. This microscopic inspection has become a popular topic in the forums. USB microscopes are cheap, but other's are using standard microscopes with stereo eyepieces to check their diamonds. A good thread with link to other thread's on the "engine" might give some tip's and techniques you can use.

https://www.vinylengine.com/turntable_forum/viewtopic.php?f=19&t=92996

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Thu, 13 Dec 2018 22:18:48 GMT

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I read a lot after visiting with you here the last few days. One of the documents I read was from Shure, who offered a microscope and instructions (attached below) for stylus inspection. Their instruction document shows illustrations of the wear patterns expected on common stylus shapes as well as actual photos of what is seen in the microscope.

I have guarded optimism that I will be able to see well enough to get good results using the 'scope. As you've said, USB microscopes are inexpensive, and I've found solid-state cameras to be pretty good these days. I've worked with remote 'scopes to see things inside automobile engines, and their solid-state cameras create surprisingly good pictures. So I'm somewhat optimistic about the USB microscope photos I'll get.

This is the Shure SEK-2 instruction manual, which describes what to look for as well as giving

some examples:
Shure SEK-2 Stylus Examination Instruction Manual

Subject: Re: Stylus Inspection
Posted by [Rusty](#) on Thu, 13 Dec 2018 23:06:23 GMT
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Yes, I've been sling'n those forum topic's left and right. The Vinyl Engine has been my staple for a long time. Lot's of knowledgeable people, (excluding me). The thing I got from that thread is tricky positioning with traditional microscopes, and proper lighting. Did you purchase a USB type? I'd think that would be more user friendly. The Shure instruction manual would scare me away from a traditional scope. I have near a dozen carts and rotate them regularly, so, I figure they will outlast me before the stylus wearing out. Still, it's kinda nice to look at the jewelry too.

Subject: Re: Stylus Inspection
Posted by [Wayne Parham](#) on Thu, 13 Dec 2018 23:30:58 GMT
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I purchased a USB microscope. It has a stand that comes with it, but I also purchased another stand that has a base more like a traditional microscope. I'll try both to see which works best for this application. The 'scope has built-in lighting so I'll try that first, but if the angle of lighting isn't right for this, I'll make a fixture that holds a couple of large white LEDs, one on each side.

This is what I ordered:
USB 40-1000x Microscope
Base/Stand

File Attachments

- 1) [Jiusion_Base.jpg](#), downloaded 752 times
 - 2) [Jiusion_Scope.jpg](#), downloaded 757 times
-

Subject: Re: Stylus Inspection
Posted by [Rusty](#) on Fri, 14 Dec 2018 15:45:31 GMT
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Slick! That stand ought to make it much easier to image the stylus proper. Maybe you'll post some images when you get the hang. Like to see that Audio Technica shibata.

Subject: Re: Stylus Inspection
Posted by [Wayne Parham](#) on Sat, 15 Dec 2018 23:51:22 GMT

My first examination is of a brand-new replacement stylus for my Audio Note AT20 cartridge.

Audio Technica AT20 cartridge in case

Audio Technica AT20 cartridge, top view

Audio Technica AT20 cartridge, front/bottom view

Audio Technica AT20 cartridge, bottom view

The stylus I'm examining is a "Bliss" branded shibata stylus, purchased from TurntableNeedles.com. The specific part is called an "ATN20 Type Shibata for Audio-Technica AT15 AT20 Cartridges" and they claim it is made by Jico. Their part number is 203-DQX.

ATN20 "Bliss" (Jico) shibata stylus for AN20 cartridge

The first thing I noticed about this stylus is the cantilever is not positioned properly, so it's a non-starter for me. I've already written the folks at TurntableNeedles.com for a replacement. You can easily see that it is offset to one side, even with the naked eye, especially when it is installed in the cartridge.

Viewed with the microscope, it is even more obvious:

Cantilever offset is clearly visible

Inserted into the cartridge, the cantilever offset is even more visible

Focusing in the tip, I can see that the built-in lighting is not ideal for stylus examination. I think the magnification is sufficient, but the lighting angle isn't right. So I'll build a fixture that houses a bright white LED on each side, to illuminate the sides of the stylus more.

Magnified ATN20 stylus tip

File Attachments

- 1) [AT20_top.jpg](#), downloaded 652 times
 - 2) [AT20_front_bottom.jpg](#), downloaded 745 times
 - 3) [AT20_bottom.jpg](#), downloaded 730 times
 - 4) [ATN20_bliss.jpg](#), downloaded 741 times
 - 5) [AT20_in_case.jpg](#), downloaded 740 times
 - 6) [ATN20_bliss_cantilever_offset.jpg](#), downloaded 720 times
 - 7) [ATN20_bliss_installed.jpg](#), downloaded 708 times
 - 8) [ATN20_bliss_magnified.jpg](#), downloaded 737 times
-

Subject: Re: Stylus Inspection

Posted by [Rusty](#) on Sun, 16 Dec 2018 15:47:09 GMT

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Is the last picture with maximum magnification? And, aside from the direct down view of the tip, are there other standard views to view how the stylus shape is best visualized to determine wear? I've used TT Needles, but never had to return anything. That is a gross misalignment with an expensive stylus replacement.

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Sun, 16 Dec 2018 18:23:13 GMT

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Two excellent questions, Rusty. Those are the questions in my mind too. This thread is as much a journey to find answers to those questions as it is to find out which of my stylus are worn. In this thread, I am documenting the process of my learning how to examine them.

But before I respond to your questions, I want to digress for a second. I want to respond to a comment that you made earlier. You said, "I have near a dozen carts and rotate them regularly, so, I figure they will outlast me before the stylus wearing out."

I'm jealous! For years, I had a Technics SL-1200 and it had a removable headshell. The AT-20 cartridge pictured above was what I ran in that turntable. I really liked it. But I sold it in the late 1980s and kept the cartridge. Later, in the late 1990s, I bought a Rega table with a Rega arm. I like the arm, but it doesn't have a removable headshell. So that prevents me from swapping cartridges.

I'd really like to be able to swap cartridges. I could use an my old Rega Elys on records that were worn badly, sort of as a "sacrificial" cartridge. I could use the AT20SL on older records in good shape, and the AT20SLa on modern vinyl. With their different vertical angles, it might be useful to be able to swap them depending on the pressing being played. But I can't do that on the Rega arm I have now.

Sometimes I think about going back to the Technics table. I love the better direct-drive tables,

and so I'm considering buying a good SL-1200. Then again, I can't hear the belt on the Rega, so it isn't a problem. It's a great table too, which is why I haven't made a change for all these years. But I always liked the idea of direct-drive tables, and especially since I could have a removable headshell when using the SL-1200. I know many audiophiles don't share my affinity for 1970s direct-drive tables, but I can't see any better approach than a high-mass platter on a very accurate direct drive motor.

So anyway, back to the topic of stylus inspection.

You asked if the last photo of the stylus tip above was taken with the USB 'scope at maximum magnification. It was the maximum I could get out of it with the setup I was using. Now then, this is the first time I used it, so I may be able to coax more out of it after I become more familiar. Especially since it was sold as a "40-1000x" device. But I don't expect much from devices at this price point, and I really think the magnification range is more like "40-100x." That's what it looked like to me. So while I think that's sufficient, it's just barely sufficient, if that. It may be that I can't really get a good view of the flat spots, even with side lighting.

My next step will be to create side mounted lighting "towers." I've already asked my 12-year-old son if I could have a few of his Legos to build the structure. I need to check and see if I have a couple of monster white LEDs. I think I do. I think I have a few hundred of them actually. I have every other color, that's for sure. But if I don't, I'll order them and fabricate a little stand for them with Legos, a drill and some glue. High-tech stuff. :lol:

If that doesn't do it, I'll be looking for a more powerful USB 'scope. Might do it anyway, just so I can get more magnification.

You also asked if there are "other standard views to view how the stylus shape is best visualized to determine wear." I don't know if there are "standard views" but I do know that we could look at various angles to get a better view of the tip. It isn't a tricky concept - we're just looking for flat spots - but what is tricky is getting a 'scope that will let us see them clearly.

The Shure document describes a "straight-down" approach which uses side lighting to emphasize the tendency for flat spots to reflect more light into the lens. Careful placement of the side lighting is important for this approach to work. The inspector is simply looking for the size of the "hot spots" on each side of the tip. It appears to me that is a useful approach that works well with limited magnification and limited clear visibility.

But it seems to me that if I can get clear visibility at high magnification levels, it would be very useful to see the stylus at a straight-on tip-forward view. Perhaps move the camera up, down, and side-to-side about 20°. Another view that I think would be interesting is from the rear, seen side-to-side and above about 20°. This would show the point of first-contact, the "edge" that gouges a record if the needle is highly worn.

So I can't help but wonder the same things you have. The question in my mind is whether I can find an inexpensive USB 'scope that will let me clearly see the tip at higher magnification levels. Surely, it is possible with the right equipment. So now I'm wondering where I can find that equipment, and whether or not there's an inexpensive 'scope that will do it. That's part of what I hope to learn.

Subject: Re: Stylus Inspection
Posted by [Rusty](#) on Sun, 16 Dec 2018 23:41:10 GMT
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Seems we have an inverse parallel with turntables. You went from Technics to Rega and I went the opposite. For me it was a matter of speed drift and feedback with the Rega that sent me to the 1200. And with the ability to change cartridges with easy VTA and anti skate adjustment makes it a breeze to swap. Hope you go back to it. You'll be buying more cartridges for sure.

I'd tend to guess that high contrast lighting rather than diffused would help in resolving the facet shaped on the stylus. If that's possible. Hope you get satisfaction with that new stylus too. I bought a stylus from LP Gear years back when I purchased a Stanton 981 HZS from KAB. The stylus was listed as a replacement for the cartridge and was around \$100 bucks. I could never get the thing to sound worth a hoot and thought maybe all the fuss about this cartridge was unfounded. I wanted to send it back to LP Gear, but months had gone by and they refused. I ended up with a Pfanstiehl stylus from Voice of Music which for twenty some bucks lets me know how good this cartridge really is. Some day maybe I'll spring for a premium from Jico. But this cheapo 2x7 elliptical sounds pretty good.

Subject: Re: Stylus Inspection
Posted by [gofar99](#) on Mon, 17 Dec 2018 02:46:43 GMT
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Hi Wayne, I use a stylus scope...actually they are designed for other things but work great for this.

Many of the ones that might seem to be useful for this are really glorified toys. I went through three until I found one that really did the job right. I would have to look up the brand though as it isn't marked on it. Additionally, you will need a stable and accurate stand for it. Most that come with the low cost scopes are pretty wonky. Observation is not quite as easy as it seems as the thing you are looking at is quite small and in a location that often makes high magnification difficult. Lighting is key as well. I find that an external light source from the side is often more useful than the lights in the scopes. Send photos when you get some.

Subject: Re: Stylus Inspection
Posted by [Wayne Parham](#) on Mon, 17 Dec 2018 17:06:17 GMT
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Rusty wrote on Sun, 16 December 2018 17:41Seems we have an inverse parallel with turntables. You went from Technics to Rega and I went the opposite. For me it was a matter of speed drift and feedback with the Rega that sent me to the 1200. And with the ability to change cartridges with easy VTA and anti skate adjustment makes it a breeze to swap. Hope you go back to it. You'll be buying more cartridges for sure.

I'm definitely lusting after an SL-1200. I didn't really move away from Technics towards Rega; It was more that I had a friend that really wanted my turntable at a time when I was never spending time at home to use it, so I sold it to him. I regretted it almost immediately, but I really wasn't using it. I couldn't part with the cartridge though. Stored it for a decade. Then one day, at one of the regional audio shows, an Audio Note dealer friend of mine offered me the Rega table I have now at a good price so I snatched it up. And I like it. But I do think I prefer the SL-1200 for all the reasons you described.

Rusty wrote on Sun, 16 December 2018 17:41 I'd tend to guess that high contrast lighting rather than diffused would help in resolving the facet shaped on the stylus. If that's possible.

I have some 10mm white LEDs that I intend to use to make lighting stands with. One on each side of the stylus.

Rusty wrote on Sun, 16 December 2018 17:41 Hope you get satisfaction with that new stylus too. I bought a stylus from LP Gear years back when I purchased a Stanton 981 HZS from KAB. The stylus was listed as a replacement for the cartridge and was around \$100 bucks. I could never get the thing to sound worth a hoot and thought maybe all the fuss about this cartridge was unfounded. I wanted to send it back to LP Gear, but months had gone by and they refused. I ended up with a Pfanstiehl stylus from Voice of Music which for twenty some bucks lets me know how good this cartridge really is. Some day maybe I'll spring for a premium from Jico. But this cheapo 2x7 elliptical sounds pretty good.

I sent back the "Bliss" stylus, and I expect to receive the replacement around the first of the year. Here in the holidays, I don't expect really fast turnaround. And that's OK. I'm not in a huge hurry.

I do wonder what difference there is in the (Bliss) Jico and in an original Audio Technica stylus. One is nude and the other is bonded, so the cantilever is different and the tip is probably different too. The mechanical interface through the adhesive in a bonded stylus is different than a cantilever with a single material in a nude stylus. It's like the difference between a pair of metal parts that are welded versus a pair of metal parts that are bolted together. One has a bit more "give" than the other. But what the difference "sounds like" - if audible at all - I don't know. Not sure I can hear the difference. We'll definitely look at 'em both close-up and see if we can see the difference though.

Which brings me to another point. It must certainly be a huge "can of worms" in some circles and offer endless opportunities to count the number of "angels dancing on the head of a pin." The point is this:

How do we measure the differences in styli or in cartridges?

I can run test signals through amplifiers and speakers and compare the difference between what goes in and what comes out. So while measurements aren't a trivial task, they aren't impossible to do either.

But how would one test a cartridge? How do we know its frequency response, for example?

I can only think that someone could use a vibrating device that provided specific displacement (or more likely inverse/square, possibly modified by the RIAA curve) at various frequencies to move the cantilever and monitor the output of the cartridge. But I can't think of any such device. So I think we all just trust the manufacturer's specifications. I know that's what I've always done.

gofar99 wrote on Sun, 16 December 2018 20:46Hi Wayne, I use a stylus scope...actually they are designed for other things but work great for this. Many of the ones that might seem to be useful for this are really glorified toys. I went through three until I found one that really did the job right. I would have to look up the brand though as it isn't marked on it. Additionally, you will need a stable and accurate stand for it. Most that come with the low cost scopes are pretty wonky. Observation is not quite as easy as it seems as the thing you are looking at is quite small and in a location that often makes high magnification difficult. Lighting is key as well. I find that an external light source from the side is often more useful than the lights in the scopes. Send photos when you get some.

I think you're right that many of the microscopes are glorified toys. The one I bought fits that description. But then again, it is almost good enough. If it was capable of just a little more magnification, I think it would work great for stylus inspection.

As an aside, I've noticed a ton of stuff in this day and age that's "glorified toys" but that does the job. It's a different world today. So many little "toyish" even "hackish" devices can be used that work well. But only for a little while - They're not robust. This is a generation that seems to design for features, not for reliability or for longevity. Seems like everything is cheap and disposable. I prefer more solid stuff, like how things were built prior to the 1970s.

Anyway, I have ordered another 'scope. This one allows changing an optical lens to allow for higher magnification. We'll see if that will get me in a little closer.

Subject: Re: Stylus Inspection

Posted by [Rusty](#) on Mon, 17 Dec 2018 18:40:19 GMT

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Wayne Parham wrote on Mon, 17 December 2018 11:06How do we measure the differences in styli or in cartridges?

What is the measurement attributed to cartridges when you see a graph. Like a test tone at a certain frequency? My take on the various cartridges I have is a little bit of, or lack of, emphasis in certain frequencies from one another. My favorite cartridge so far, a Stanton 890 LE from KAB, I believe a moving iron type seems to give the greatest inner detail. My last purchase of a moving magnet cartridge, a Ortofon Super OM 30 convinced me that, enough already, they're all nice and fine, just play the music.

I'm curious now in regards to the stylus I mentioned for a Stanton 981 HZS that came from LP Gear, I wonder if they shipped me, by mistake or otherwise, the wrong stylus. It sounded like crap. I couldn't see with a loupe any numbers or marks, other than a green dot on the cantilever. I wonder if I could tell with one of these USB scopes whether it was say a conical, or elliptical type stylus.

I'd better wait though to gather what you've concluded for tips and techniques.

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 17 Dec 2018 19:16:16 GMT

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I would expect that a person could measure many of the same things that are measured for amplifiers and loudspeakers - at least the two-dimensional ones - like frequency response (amplitude and time), harmonic and intermodulation distortion, etc.

I assume there are more audible differences between cartridges than styli. But I guess I don't know that for sure. And especially since the stylus contains "half of the equation" - either the moving magnet or the moving coil - my assumption could be quite invalid. I suppose most replaceable styli are moving magnet, so I guess magnet strength could be a big factor.

Magnet strength is a huge factor in loudspeakers. Changing magnet strength changes the tonal balance of the driver. Of course, the driver is used in a tuned cavity, so that's a part of it. The interaction between the tuning of the driver and the tuning of the cabinet is important - they have to be "tuned together."

That same sort of thing may not be (as much of) an issue in cartridges. But the mass/spring system formed by the cantilever/magnets and the "suspension" at its pivot point are one tuned system and the coils and the preamp's reactive load are another. The manufacturer specifies the reactive load required by the cartridge, and they design the stylus specifically for use with their cartridge, so that's how they control those variables.

My assumption is that I can trust the manufacturer's published specifications. And hopefully, third-party manufacturers of replacement styli are also diligent and produce products that maintain manufacturer's standards. But these are the things I do not really know, so thinking out-loud, I wondered about testing with a vibrating machine or test record and analysis software.

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 17 Dec 2018 22:38:28 GMT

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Another aside:

On the matter of measuring cartridges, I found the article in the attached "Bruel & Kjaer Technical Review" journal from 1976. Pages 25-34 discuss using an accelerometer to provide a signal for testing turntable cartridges.

Bruel & Kjaer Technical Review, 1976, No. 2

This is what I was talking about, exactly. But it's really beyond the scope of this thread. Here I'm focused on examining the condition of the stylus tip, to know when to replace it. So I've sort of hijacked my own thread. :lol:

Cartridge measurement might be a worthwhile discussion in another thread though.

Subject: Re: Stylus Inspection

Posted by [gofar99](#) on Fri, 21 Dec 2018 03:03:21 GMT

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Hi, Actual cartridge measurements are not simple. The only way that I know of that works fairly well is to use a test record. I use the Analogue Productions Ultimate Test LP. I admit to being a serious vinyl enthusiast and what I do is likely well above typical. I use the LP to test individual cartridge/tonerarm/turntable combinations. I take the output from the cartridge and feed it to a Simaudio LP3 preamp. It is extremely linear and quiet, just not musical IMO. That in turn feeds a dual trace oscilloscope. It is PC based and I can get all sorts of information from it. I find that some combinations work better than others and going back to the issue of stylus shape and construction there is no real correlation in my tests as to the type when you get to elliptical and higher and how it actually is mounted. Not much difference in MM vs MI either. Then to be honest I have only mid to high end cartridges/arms and turntables. I do find that that the arm needs to be of the right mass range for the cartridge and the tracking force, anti skating and alignment need to be spot on. My two favorite combinations are a Grado Sonata II in an Origin Live arm on my Empire 598. The second one is a Dynavector Ruby Karat23MR-RS in a Jelco arm on a much modified DIY player that uses the drive system of a Dual 701. I use a Pro-ject Align It to set the alignments and a digital scale to set the tracking force. Anti skating is via the listed test method above.

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Fri, 21 Dec 2018 22:09:20 GMT

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That's very interesting, Bruce. Good information that whets my appetite for more. So I've started a "Cartridge Measurement" thread to discuss what's involved in measuring cartridges. If you wouldn't mind, please post your observations there as well. You've got a big head start on this matter.

I suppose a whole 'nother thread should be started on turntable/arm setup. There's just so much disinformation out there; I think it would be useful to compile information on the subject here on AudioRoundTable.com.

Back to the topic of stylus inspection, I just received another USB 'scope. It has a replaceable lens to allow higher magnification. I'm anxious to use it to look at the "Bliss" replacement stylus and to compare it with the genuine Audio Technica stylus. The trouble is my genuine stylus is worn, and I don't know how badly worn it is. That's one of the main reasons I bought this 'scope and started this thread.

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 14 Jan 2019 00:20:19 GMT

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I've learned a lot, and I have a lot more to explore. So I'm here to report the things I've found.

First, TurntableNeedles.com sent a replacement for the defective Jico/Bliss stylus. They said they have never seen this kind of problem before but asked no questions and didn't hesitate to exchange it. You can see that the one they sent is well-formed:

ATN20 "Bliss" (Jico) Stylus

File Attachments

1) [ATN20_Bliss.jpg](#), downloaded 820 times

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 14 Jan 2019 00:35:46 GMT

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I am comparing the ATN20 "Bliss" stylus with a genuine original Audio Technica AT20 stylus. Both have the Shibata shape.

File Attachments

1) [Styli_Shapes.jpg](#), downloaded 764 times

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 14 Jan 2019 00:45:17 GMT

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As an aside, I am also comparing the AT20SL cartridge with the AT20SLa. Upon casual inspection, you don't really notice a difference in the two. But Rusty clued me into the fact that the AT20SLa has a slightly different cantilever angle. When you hold them side-by-side, you can see this:

Audio Technica AT20SL and AT20SLa, top view

Audio Technica AT20SL and AT20SLa, side view

Audio Technica AT20SL and AT20SLa, bottom view

The original AT20 cartridge is on the left in all three photos. The AT20SLa is the same cartridge electro-mechanically, but it is slightly shorter and the stylus mount is angled differently. As a result, the vertical angle of the AT20SL is 20° and the AT20SLa is 15°.

File Attachments

- 1) [AT20SL_and_AT20SLa_top.jpg](#), downloaded 839 times
 - 2) [AT20SL_and_AT20SLa_side.jpg](#), downloaded 809 times
 - 3) [AT20SL_and_AT20SLa_bottom.jpg](#), downloaded 828 times
-

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 14 Jan 2019 01:08:50 GMT

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The original stylus I'm comparing with looks like this:

Original Audio Technical AT20 stylus

Side by side comparison:

Left: ATN20 "Bliss" Stylus, Right Original Audio Technica AT20 Stylus

Left: ATN20 "Bliss" Stylus, Right Original Audio Technica AT20 Stylus

File Attachments

- 1) [ATN20.jpg](#), downloaded 472 times
 - 2) [ATN20_bottom_comparison.jpg](#), downloaded 483 times
 - 3) [ATN20_top_comparison.jpg](#), downloaded 478 times
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Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 14 Jan 2019 01:30:09 GMT

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Comparison of the two styli at 100x magnification:

Audio Technica AT20 Stylus Tip (at 100x magnification)

"Bliss" ATN20 Stylus Tip (at 100x magnification)

Audio Technica AT20 Stylus Suspension (at 100x magnification)

"Bliss" ATN20 Stylus Suspension (at 100x magnification)

Audio Technica AT20 Stylus Suspension, Magnet side (at 100x magnification)

"Bliss" ATN20 Stylus Stylus Suspension, Magnet side (at 100x magnification)

Audio Technica AT20 Stylus Magnets (at 100x magnification)

"Bliss" ATN20 Stylus Magnets (at 100x magnification)

Audio Technica AT20 Stylus Magnets (at 100x magnification)

"Bliss" ATN20 Stylus Magnets (at 100x magnification)

One thing I learned was the focal point of the microscope was so tight that it could either focus on the cantilever suspension or the tip of the magnets, but not both. This is really apparent at higher magnification levels, as you'll see next.

Subjectively, the Audio Note stylus tip looks "dirty" at this magnification level. The Bliss tip looks better at 100x. But as we zoom in closer, the Audio Note looks pretty good. And at higher magnification levels, you can see the Shibata shape.

File Attachments

- 1) [ATN20_Stylus_100_01.jpg](#), downloaded 415 times
 - 2) [ATN20_Stylus_100_02.jpg](#), downloaded 473 times
 - 3) [ATN20_Stylus_100_03.jpg](#), downloaded 446 times
 - 4) [ATN20_Stylus_100_04.jpg](#), downloaded 474 times
 - 5) [ATN20_Stylus_100_05.jpg](#), downloaded 452 times
 - 6) [ATN20_Bliss_Stylus_100_01.jpg](#), downloaded 484 times
 - 7) [ATN20_Bliss_Stylus_100_02.jpg](#), downloaded 471 times
 - 8) [ATN20_Bliss_Stylus_100_03.jpg](#), downloaded 444 times
 - 9) [ATN20_Bliss_Stylus_100_04.jpg](#), downloaded 470 times
 - 10) [ATN20_Bliss_Stylus_100_05.jpg](#), downloaded 456 times
-

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 14 Jan 2019 01:40:38 GMT

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As I said, the focal point of the microscope is so tight that it could either focus on the cantilever shaft or the tip of the stylus, but not both. At higher magnification levels, it would even focus only on a section of the tip. So I rolled the focus knob up and down to focus first on the base, then the middle and finally the tip.

I've seen photos of highly magnified views that had good clarity through a range of distances, so I wonder if they are using imaging equipment that is capable of that, or if they are gathering multiple images and splicing them together. Perhaps better imaging equipment is capable of doing that automatically. I don't know, but I do know that with what I'm working with, you have to choose a single focal point.

So I've attached both static photos of the styli tip, and also animations showing me "roll through" focal points from base to tip.

Comparison of the two styli at 1000x magnification:

Audio Technica AT20 Stylus Tip (1000x magnification)

Audio Technica AT20 Stylus Tip (1000x, rolling focal point)

Bliss ATN20 Stylus Tip (1000x magnification)

Bliss ATN20 Stylus Tip (1000x, rolling focal point)

File Attachments

- 1) [ATN20_1000.jpg](#), downloaded 455 times
 - 2) [ATN20_1000.gif](#), downloaded 465 times
 - 3) [ATN20_Bliss_1000.jpg](#), downloaded 475 times
 - 4) [ATN20_Bliss_1000.gif](#), downloaded 490 times
-

Subject: Re: Stylus Inspection

Posted by [Wayne Parham](#) on Mon, 14 Jan 2019 02:32:24 GMT

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Comparison of the two styli at 2000x magnification:

Audio Technica AT20 Stylus Tip (2000x magnification)

Audio Technica AT20 Stylus Tip (2000x, rolling focus)

Audio Technica AT20 Stylus Tip (2000x, rolling focus with extra contrast)

"Bliss" ATN20 Stylus Tip (2000x magnification)

"Bliss" ATN20 Stylus Tip (2000x, rolling focus)

"Bliss" ATN20 Stylus Tip (2000x, rolling focus with extra contrast)

I think the 1000x microscope lens worked best for me. The 2000x was a little too much and the 100x was a little too little.

The USB microscopes were definitely not the highest-quality units available. I think probably

some really good images could be captured with a better quality 1000x 'scope. With a high-quality digital microscope, one could possibly capture images good enough to be used to render 3D models of styli from each manufacturer, and catalog them all for comparison. But that's beyond the scope of this discussion. The goal of this thread was to be able to identify worn stylus with an inexpensive microscope and I think we've been able to do that.

The Audio Technical stylus is used, but doesn't appear to be worn. I still plan to view both styli with side-mounted lighting and to look for the "hot spots" on either side as prescribed by Shure. But for now, just viewing the styli with the built-in camera lighting, I could still see the tips well enough to draw the conclusion that neither were excessively worn.

File Attachments

- 1) [ATN20_2000.jpg](#), downloaded 441 times
 - 2) [ATN20_2000.gif](#), downloaded 481 times
 - 3) [ATN20_2000_extra_contrast.gif](#), downloaded 459 times
 - 4) [ATN20_Bliss_2000.jpg](#), downloaded 433 times
 - 5) [ATN20_Bliss_2000.gif](#), downloaded 434 times
 - 6) [ATN20_Bliss_2000_extra_contrast.gif](#), downloaded 408 times
-

Subject: Re: Stylus Inspection

Posted by [Nouri](#) on Wed, 14 Oct 2020 19:35:25 GMT

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EXCELLENT!!!!

This is all information worth printing and storing. Vinyl records are making a comeback and I for one couldn't be happier, so everything turntable related is worth re-learning.
