

Tonochi's Audio Room – Supplemental Info

Maintenance of Analog Disc



2019/08/02

Cleaning and Daily Maintenance of Analog Discs (vinyl records)

The cleaning technique introduced here is not 100% Tonochi's idea. I combined two techniques invented by seniors and expanded it in my way.

The technique that utilizes an analog disc player (AD player) and a carbon brush was invented and published by late Mr. Tetsuo Nagaoka. And the other one that utilizes ethanol and nonwoven cloth was introduced on the audio magazine, MJ, many years ago. I can't remember who invented the latter one. I suspect it isn't appropriate that I introduce it here, but I dare to write it, since techniques and know-how concerning the analog disc are being forgotten these days.

Not using any commercial audio goods for both cleaning and daily maintenance is distinction of Tonochi Method.

Tools for Cleaning

Carbon Fiber Brush

Make a brush that can be attached to the tonearm using the following parts:

- Carbon fiber brush
- Cheap headshell
- Weight (coins)
- Bond
- Adhesive tape

Carbon fiber is so tough that can't be broken by force even if it is thin. It is the best thing to pick out dirt off the groove. Attach it to the headshell so that it can be used with an AD player.

Mine is originally a stylus cleaner. I've forgotten how I got it. Maybe, it wasn't a commercial product but an accessory of some cartridge.

I remove the handle off the brush and glued it on the headshell. And I attached three (10-yen) coins with adhesive tape so that this tool had a proper weight.



Unwoven Cloth

A cleaning cloth for eyeglasses is the best choice.

20% Ethanol Solution

This liquid solution is made by diluting ethanol with purified water. The concentration is 20%, but it shouldn't be exact. The necessary quantity for one or two analog discs is small. The remaining ethanol solution should be kept in a sealed container for the future use.

The both ethanol and purified water are available at a drug store.

Other Tools

The following items are necessary:

Newspaper, tissue paper, a faucet with a water purifier installed on it.



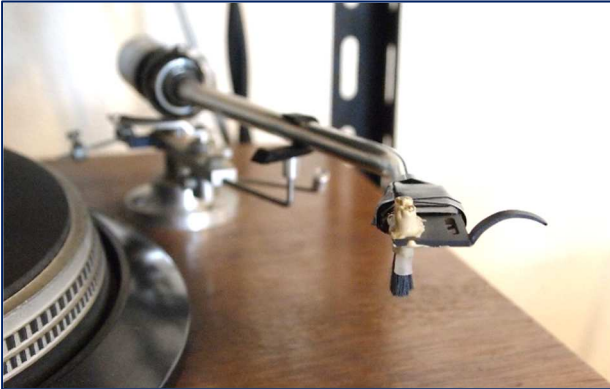
Procedure of Cleaning

Follow the steps below:

1. Cleaning with the carbon fiber brush
2. Washing with running water
3. Cleaning with the ethanol solution and the unwoven cloth

4. Washing with running water
5. Drying out
6. Test replay

Cleaning with the carbon fiber brush



Attach the carbon fiber brush to the tonearm just like a cartridge.

Screw the counter weight so as to maximize the stylus force. Set the anti-skate mechanism to the maximum, too.



Put the disc to be cleaned on the platter, lift down the brush and turn on the turntable just like playing the vinyl record. Wait till the brush cleans the whole disc.

As long as the brush can trace the groove, you can make the turntable rotate faster. Technics SL-1200GR is convenient, because its max speed is 78 rpm.

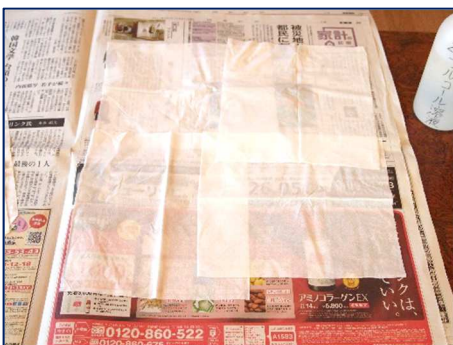
Clean the other side of the disc in the same way.

Some discs are so dusty that the brush catches a lot of dust, even if they look clean. Discs like them cause unpleasant noise and/or distortion at the inner part of the disc. The photo on the right shows an example.

Don't forget to clean the brush after the cleaning of the disc is finished.



Washing with running water



After cleaning with the carbon fiber brush and cleaning with the ethanol solution and the unwoven cloth, wash the disc with running water. It is recommended that the water is purified with the water purifier.

First, make the space where the wet disc is placed. Put newspaper on a table, and put four pieces of tissue paper on it.

Next, open the faucet fully.

Hold the disc under the faucet aslant, and let the water run on the disc. Rotate the disc bit by bit so that the whole surface is washed.

Wash the other side in the same way.



The labels of some discs are faded because the ink of label dissolve in water. Especially, the labels of CBS/CBS SONY records in 1970's, of which color is orange, tend to fade.

To prevent fading, the label should be masked with masking tape beforehand.

I don't care so much of fading that I don't use the making tape. The label fades a little, but not so much as the letters on the label become illegible. I don't mind.

After washing the disc, put it on the newspaper and tissue paper prepared for drying.



☞ Put other four pieces of tissue paper on the disc.

Put another newspaper on it, and hold it down with hand so that the tissue paper absorbs the water. ☞



Cleaning with Ethanol Solution and Unwoven Cloth



Fold the unwoven cloth, and moisten it with the ethanol solution.

Press the cloth hard against the disc, and move the cloth clockwise while keeping it pressed hard by putting your weight on it.

The direction is opposite to the trace of the cartridge.

You may be afraid rubbing the disc so hard could damage it, but don't worry. The dust was already removed in the earlier steps. If you scamp this work, pitch-like crud and/or mold would remain. The merit of Tonochi Method is spoiled.

Drying



After washing with running water, put the disc on the newspaper and tissue paper, and put some pieces of tissue paper on the disc, as shown in the left picture. Leave them till it dries.

The drying time is around 5 hours, though it should be longer or shorter depending on temperature and humidity. The disc must be dried completely before it is stored in the sleeve. Otherwise, it could go moldy.

Turn the disc at intervals to dry the both sides.

Make the interval longer as the disc gets dries. For example, first, 5 minutes, next, 15 minutes, then, 30 minutes, ...

Put the disc after it is perfectly dry.

Check

After the cleaning, the disc must be replayed to check if the cleaning was successful. If noise is still heard, redo the cleaning.

This replay is not only the check but also the final step of the cleaning.

The stylus tip rakes out remaining tiny dust and/or mold from the groove. In fact, I have some experiences that crackle noise got smaller each time I replayed a disc that was still noisy after cleaned by Tonochi Method.

You'd better not replay the cleaned disc before it's perfectly dry, or the disc could be damaged. I don't check the disc immediately after the cleaning. I do it next day or later (within one week).

Daily Maintenance

Before and after replay, I blow dust off the disc surface with a blower brush for camera maintenance. I detach the brush when I use the blower for record cleaning.

It is all I do for the daily maintenance of vinyl discs.

I never use tools and goods sold at an audio shop for daily maintenance as in cleaning the disc.



Reasons Why I Never Use Record Cleaners

I don't intend to deny other audiophiles' methods, but I have some reasons to avoid using commercial record cleaners.

The most commonly used record cleaner is made of fine felt (or something like that). It directly touches the disc surface and wipes it. (Actually, I have one, but I've never used it)

This type of cleaners has some problems:

1. It catches only fiber dust. In the air, not only fiber dust drift, but only granulated dust. The typical one is quartz particle. There is also iron powder drifting in the air near railroads. When you wipe the disc, the particles are pushed into the groove. The particles in the groove make the sound unclear, and it is difficult to remove the particles.
2. Wiping the disc with the cleaner builds up electrostatic. To prevent it, you need some antistatic measure like a record spray. Antistatic agent could be a cause of deterioration in sound quality.
3. Chemical products such as antistatic and protecting agents may cause a problem. They don't do wrong when they are applied, but they could absorb moisture and dust in the air as time elapses. They could impair sonics in the long run. Besides, there are some case that the stylus gets sticky dirt when the disc on which chemical stuff is applied. This could damage the cartridge.
4. It is difficult to keep the cleaner perfectly clean. Using a dirty cleaner defeats its own purpose. You must clean the cleaner every time you use it. But how?

It's possible to keep vinyl discs in a good condition without chemical goods. You should avoid using them to be on the safe side.

I recommend you test the chemical stuff if you want to use it.

Apply it on a window pane, wait for a while, and check if it completely disappeared. If there's still something on the pane, you shouldn't apply it on vinyl discs.

Results

Most dirty records can be cleaned by the Tonochi Method.

The exceptions are discs that have some kinds of dust such as oily, sticky one, and that have mold in the depth of its groove.

In case that crackle noise remains after cleaning, the cause is probably mold in the deep groove. In this case, the noise could be reduced by repeating replay as I describe later.

When the disc is so dirty, I clean it twice. If it is still dirty after the second cleaning, I gave it up. The third time isn't so effective.

After the cleaning, no special maintenance is necessary. Good, low-noise sonics continues for 15 to 20 years without further maintenance, as long as the discs are used normally.

As I explained earlier in 'Daily Maintenance', all you need is blow dust with a blower brush.

The drawback of Tonochi Method is time and labor it requires. I can clean up to two discs a day. Treating three discs at a time is possible, but it's hard to get a place for drying three discs (my house is too small). So I always treat two discs.

Examples

Here are some examples:

Tonochi Method is often effective even for very dirty discs. I look for junk records at a nearby secondhand shop from time to time. I buy junk records if I am interested in them. So far (as of July 2019), I cleaned 19 junk records. 11 records out of them have been perfectly recovered. And, three became in good condition. In total, 14 out of 19 junk records have added to my vinyl collection.

Example #1

This is one of the junk records I could revive. It's Akira Inaba's debut album (LP, Akira Inaba, *Nanika Iwasureta Youde*, Disco Mate DSF-4002).

The jacket was rather good, but the disc was so dirty it almost looked like a trash. I hesitated to buy it, but it sold for only 50 yen (before tax), and I thought it would be a good example to evaluate the effectiveness of Tonochi Method. I bought it.

The result was perfect! Now it looks like a mint record. The sound quality is very good too. I am fully satisfied with this excellent record that cost me only 52 yen (including tax)!

This success encouraged me to buy more junk records. I've found more junk records that are dirty but not scratched since then.



☞ The jacket was not dirty.

After the cleaning, it was clean, or ☞ even shiny. I should've taken a picture of it before the cleaning. It was so dirty before.



Example #2

This isn't a junk but an ordinary used record.

It's Mahler's Symphony No.4 performed by Solti and Chicago Symphonic Orchestra (LP, G. Solti, CSO, Te Kanawa, *Mahler: Symphony No.4*, London L20-C2043).

The disc looked good originally, but after cleaned twice, it still had crackle noise on the side B.

I guess the cause is mold. Mold in the deep groove is hard to remove even by Tonochi Method.

I almost gave up. But I wanted to listen to Te Kanawa at any cost. I played the disc many times. I noticed that the noise was reducing, as I played the disc. After 4 or 5 replays, the noise was lowered to the extent that I was no longer bothered.

I learned that playing the record is actually a good cleaning method.



☞ Both the jacket and the disc looked clean.

Crackle noise remained after the ☞ cleaning. The noise got low each time the disc was played. Now the disc is almost noiseless.



Example #3

This one is also a used record. Both the jacket and the disc looked clean and nice. I didn't think it had any problem. I noticed there was a sticker that said "Sound Guard applied" on the label of the disc. I supposed the previous owner of this was an audiophile and handled it carefully.

This record is Tyzik's "Radiance" (LP, Tyzik, *Radiance*, Capitol ECS-81521, 1982). I was sure the sound quality of this was very good because it was the fusion record in 1980's.

As soon as I brought it home, I played this record. The noise level was low and the sonics was so so, but it wasn't as good as I had expected. Its sound was not so transparent. I suspected Sound Guard was aged and made the sonics worse. I decided to clean it by Tonochi Method to rip the coating of Sound Guard off the disc surface, and check if sound quality would change.

I recorded the first tune on the side A in DSD5.6M format before the cleaning (the recording is called 'Before' hereafter). After the cleaning, I recorded it in the same conditions (the recording is called 'After' hereafter). I compared the two recordings by listening and analyzing waveform data.



☞ Both the jacket and disc looked clean.

The label of this record ☞
The sticker "Sound Guard applied" on the label.



See the waveforms on the next page.

Both the recordings have almost the same waveform when the amplitude was large, but the waveforms slightly differ when the amplitude was small. It seems that After has larger amount of signal (the parts indicated by the blue circles).

I listened to the recordings (DSF files) with Gaudi II.

They weren't so different in sound quality as I had expected. I listened to them some more times. Then, I noticed there was a slight difference. I felt the After had wider sound stage than the Before. Besides, the sound images were sharper and the localization was more stable. The lyrics sung by male vocalists were easier to catch.

However, it was very slight difference. I might have been biased by preconception.

I couldn't distinguish them when I listen on PC (HP Pavilion + KORG AudioGate 4 + Bose Media Mate II).

There was one thing I couldn't understand.

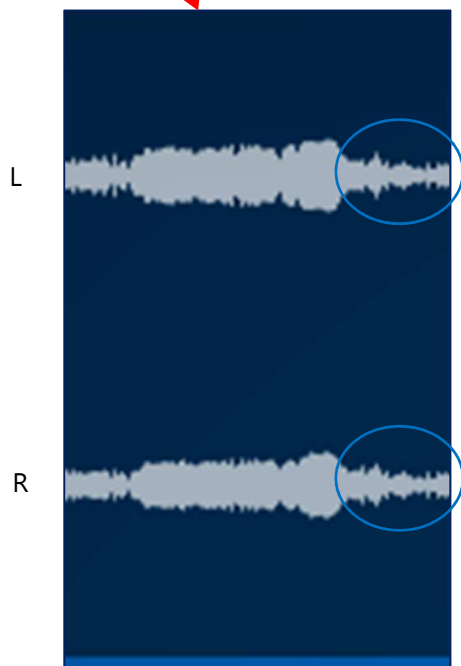
Crackle noise was heard louder between tracks on the After. I don't know why, but guess that foreign particles that were buried in the coating of Sound Guard surfaced after the cleaning.

[2019/08/02 added] {Later, the crackle noise gradually disappeared as I played the record more and more. Now, it can't be heard. The sound quality of this disc became so good}

Before



After



☞ Before

After ☞



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