FURUTECH RD – 2 DISC DEMAGNETIZER

The Furutech RD-2 can be used to demagnetize any optical DISCS, such as CD, DVD, MD, and even Audio/Video CABLE wires and POWER cords. The RD-2 will rejuvenate their original tone quality and data image quality as vivid and lively.

The RD-2 has the following Patents:

- Japan Patent: No. 2942760
- U.S. Patent: PN/6058078
- Taiwan Patent: No. 110354

Theorem & Structure

* It is absolutely impossible to obtain intact signals from a DISC if the DISC is magnetized (deteriorated), not to mention excellent tone quality and image quality.

? What makes a DISC, such as CD,…etc., magnetized?

1. The label of the painted portion of a DISC contains chemical compositions, such as Iron, Ni, and Cobalt that are strong-magnet materials, which are easily magnetized.
2. The recording reflecting surface of a DISC contains 99% aluminum and 1% of magnetic substances such as Iron, Ni, and Cobalt. In addition, aluminum is a weak-magnet material, which is also easily influenced by magnetism.

The above descriptions clearly show that a DISC is magnetized during reproduction by a DVD or a CD Player because of a magnetic field, which is generated by strong magnetic induction and the motor rotation of the recording head. The same problem can be found in any CDR, DVD, VCD, CD, or MD. Particularly, the Magnet Catch of a MD is the most seriously influenced portion and may further cause problems with un-readability.

Current demagnetizers (e.g. Head Eraser, Bulk Eraser…etc.) on the market are unable to completely demagnetize recording DISCS; contrarily, it may probably induce magnetism. In addition, considering shapes and methods, those demagnetizers are also unable to successfully demagnetize DISCS and CABLES, but generally lead to counterproductive effect to them.

The Data Graph shows evidence that prior to the demagnetization process magnetism has much impact on reproducing the original data from a magnetized DISC (i.e., it is unable to entirely retrieve the quality of data for real owing to magnetism).

On the other hand, it is also impossible to have perfect effect of reproduction when applying any DISC prior to demagnetization (stained SOFT) to high-level and valuable apparatus. It is obvious that those inferior signals magnified by Amp and played by Speaker simply produce poor quality (i.e., the tone quality to CD, and the image quality to DVD), as high-level and valuable Amp and Speaker are not tools for retouching and embellishing the original Source. Therefore, the best way of reproducing pure and perfect effects of the tone quality and the image quality of a DISC is to completely demagnetize magnetism from it; thereby allowing recorded data of a DISC to be accurately read by Amp and Speaker for playing without jamming and being magnified.

FURUTECH DISC DEMAGNETIZER RD-2 is an all-time product that easily removes magnetism from any DISC to allow unprecedented acoustic and visual pleasure during DISC reproduction.

Applicable to all kinds of optical DISCS

It is suitable for all optical information recording DISCS, e.g., CD, MD, VCD, DVD, Laser DISC, Game CD, CD-R, CD-ROM, Photo CD, SACD, DVD Audio, DVD Record…etc.

- **NOTE! The demagnetization process had been performed for completely new CD-R, MD… etc. during their productions.**

The demagnetization process had been performed for completely new CD-R, MD…etc, during their productions (i.e., manufacturers did realize that the demagnetization process enhances the capability of SOFT). However, due to price competition, most manufacturers have skipped the demagnetization process on DISCS that causes magnetism problems on SOFT. Therefore, better DISC products for reproductions can be assured, if any new DISC, such as CD-R, MD…etc, prior to the process of being Digital recording, can be demagnetized by RD-2 demagnetizer.

- **The effects on DVD and Laser DISC**

RD-2 demagnetizer enables superexcellent tone quality and image quality of DVD and Laser DISC.

First, to describe the enhancement of the image quality: the demagnetization process entirely eliminates existing NOISE and enables the excellent display of a frame. The contrasts of display become more clear, bright color tones will become more brilliant, and dark color tones are relatively well-lit; the effects on high-colored red are especially amazing.

Second, to describe the enhancement of the tone quality : the SURROUNDING effects of sound levels are perceptibly heightened and the rhythmic intensity is remarkably strengthened. The details of sounds that could not be heard before the demagnetization process can truly perform, as do human sounds. RD-2 demagnetizer enables extraordinary effects on the concrete and fidelity of music compared to DISCS prior to demagnetization process.

The enhancements of both tone quality and image quality cannot be achieved by simply upgrading higher classes of apparatus. Apart from DISC, RD-2 demagnetizer can also be applied to other peripherals, e.g., video cables, power cord, audio cables.

Applications (master-strokes)

The performance of an AV system will have exhilarating results as a whole, after all kinds of peripherals-- such as Cable, Power Connector, 2Tap, Consent--are demagnetized by RD-2 DISC demagnetizer. In fact, not only do DISCS cause magnetism problem resulting in poor tone quality and image quality, but the aforementioned peripherals (e.g. Cable, Power Connector, Tap, Consent…etc.) confront the same problem.

It is hypothesized that electronic current generates magnetism when it flows through peripherals (e.g. Cable, Power Connector, Tap, Consent…etc.) with such magnetism disappearing while electronic current dissolves. However, the truth is that contained impure substances or used magnetic materials lead to magnetism and further generate magnetic bodies, which have negative impact on the qualities of transmitting power and signals, and cause deterioration problems. No matter how valuable or expensive a Cable or Power Tap those peripherals are, there is no way to have desired performance from those peripherals without having the magnetism problem solved first.

Given the aspects of structure and mechanism, there are no other demagnetizers besides the RD-2 demagnetizer applicable to peripherals like Cable, Power Connector, Tap…etc.; moreover, the demagnetization effect of RD-2 demagnetizer on CD is much better than that of other demagnetizers. The RD-2 demagnetizer can also be flexibly multi-applied to metal accessories such as CD Stabilizer, Speaker, Terminal…etc. without problems.

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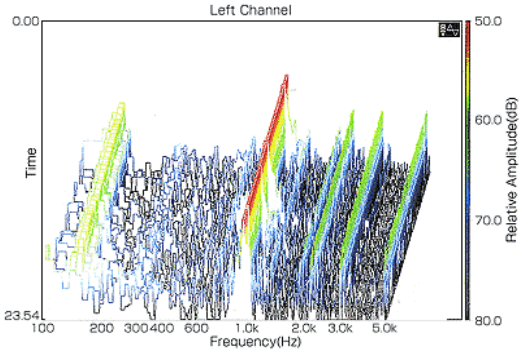
Statistics(illustrations)

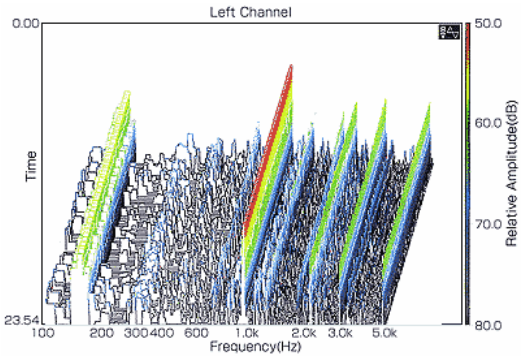
- applied apparatuses : CD Player---Marantz CD-16SE, Computer---PC-98 Xa7
  Soft--Sound Technology Co., LTD. Spectral LAB

3 dimension spectrum Date of Lever&Time based on 3D Surface View mechanism of SPECTRA PROFET Analyzer

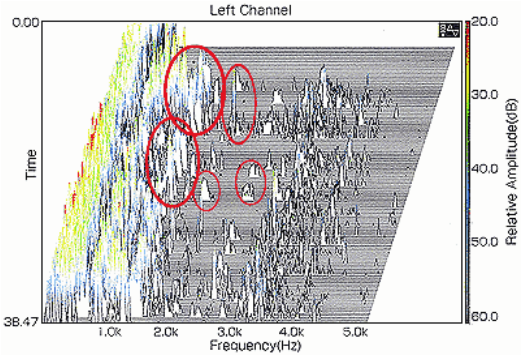
1. **1KHz signal of a Data test**

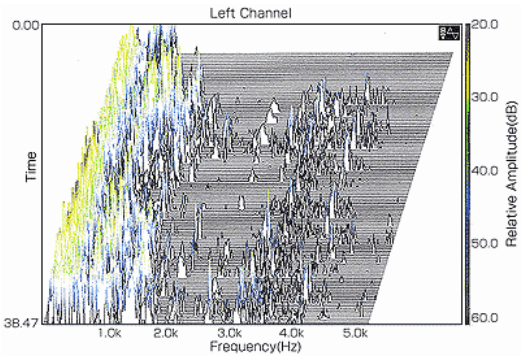
(Not only a 1KHz signal of sine wave, but also other frequencies can be displayed) (as shown in graphs) First, when observing the signal prior to demagnetization, crests other than a sine wave are generated in the 1KHz signal components, which are considered NOISE or distortion by magnetic fields. Likewise, white blank portions are seen in the 1KHz signal components. It is believed that these blank portions are deficiencies in sound caused by read errors. Judging from the crests extending crosswise, it is also believed that the rise and fall of the sound becomes worse. Moreover, dispersions and irregular portions are generated in bands other than 1KHz, and an excessive amount of small crests are seen in the range between 200~800Hz. These small crests are also considered to be NOISE and distortion components.





After demagnetization, the excessive crests included in the 1KHz signal components disappeared, as well as the blank portions. The crests also became uniform in height and the deterioration states shown prior to demagnetization almost disappeared. The crests in other bands also became uniform and most of the excessive crests are gone in the range of between 200~800Hz. Judging from these experimental results, the SN ratio improved greatly, and distortions in the audible range were considerably lessened. Therefore, distortions were removed and sound extensions after demagnetization performed excellently, with smooth connectivity among upper, mid and lower frequencies.





2. **Data testing of Musical signals**

(as shown in graph)

In the vicinity of 20 seconds in the range of from 1KHz to 5KHz of the red portions in the graph, in particular, it is clearly seen that the number of crests increases, meaning that the quantity of information actually increases as a result of demagnetization. The heights of the crests also generally increase, indicating that the respective ranges are extended.

3. **Various Data testing on Musical CD**(recording time of the track : 4' 45'')

	Output Power Level PWL(db)	thorough harmonic distortion THD(%)	Signal-to-noise ratio SNR(%)
no YUMI	-13.36	72.11	2.047
UC YUMI	-13.36	71.75	2.117
RD YUMI	-13.94	70.99	1.866

Remarks:

no YUMI— the reproducing result on a used musical CD prior to demagnetization

UC YUMI— the reproducing result after demagnetization using the CD demagnetizer by other manufacturer(imported brand)

RD YUMI— the reproducing result after demagnetization using the RD-2 demagnetizer

RD YUMI shows the lowest PWL value, as NOISE is very low. In addition, the rising of respective Peak level of Analyzer indicates that musical signals are increasing and NOISE becomes the lowest value after the CD is demagnetized by RD-2 demagnetizer. The lowest THD value also shows that the demagnetization process by RD-2 enables the distortion effect of whole musical tone to be apparently reduced. On the other side, the SNR value increased while processing the magnetic CD by strong magnets through the method of motor rotation by a product (imported brand) of another manufacturer. We learned that the kind of product does not employ the demagnetization process to eliminate magnetism from the CD, instead, it simply makes uniform the direction of magnetic field; that is why the SNR value increased. This method will eventually lead to deterioration of the tone quality.

4. The results on CD-ROM

Read value is 590KB/s with 65 points in total of a DISC prior to demagnetization, whereas read value is 620KB/s with 69 points in total of a DISC after demagnetization. Apparently, the rising of value shows that RD-2 demagnetizer has great impact on reading CD-ROM.

In addition, there are occasional cases that a CD-ROM or RAM cannot be read or recorded; it is caused by damage of signal surfaces of the DISC or a reject. It may possible be magnetized, which can be removed by RD-2 demagnetizer to conduct normal performance.

	READ(KB/s)	Total
Before	590	65
After	620	69

5. The decrease of error rates

Let us measure musical CD by CD Quality Control QA-101D produced by Clover System Co., Ltd. In U.S.A.

? Table 1? before being demagnetized

AVG.	BLR	E11	E21	E31	E12	E22	E32	TE22
1	719.9	671.8	36.4	1.9	11.6	0.1		431.0
2	716.0	676.5	36.9	1.8	9.9	0.1		388.0
3	715.0	675.7	36.8	1.6	8.7	0.1		300.0
4	713.4	674.0	36.6	1.6	8.6	0.1		291.0
5	713.5	674.4	36.7	1.5	8.0	0.1		155.0
GAV	715.56	674.48	36.68	1.68	9.36	0.08	0.00	313.00

? Table 2? after being demagnetized

AVG.	BLR	E11	E21	E31	E12	E22	E32	TE22
1	710.8	672.2	36.3	1.5	7.9	0.0	0.0	160.0
2	714.2	675.1	36.7	1.5	8.0	0.0	0.0	177.0
3	715.2	676.0	36.8	1.5	8.0	0.1	0.0	193.0
4	718.1	678.7	37.0	1.5	7.9	0.0	0.0	130.0
5	712.9	674.0	36.5	1.5	8.1	0.0	0.0	135.0
GAV	714.24	675.20	36.66	1.50	7.98	0.02	0.00	159.00

? Table 3? the highest values(before being demagnetized)

AVG.	BLR	E11	E21	E31	E12	E22	E32	TE32
1	870.0	807.0	54.0	27.0	226.0	18.9	0.2	4.0
2	875.0	811.0	57.0	27.0	213.0	14.7	0.2	3.0
3	875.0	810.0	55.0	27.0	218.0	13.3	0.1	2.0
4	874.0	814.0	56.0	27.0	228.0	15.9	0.5	7.0
5	871.0	807.0	54.0	27.0	226.0	9.4	0.1	1.0
AV	873.00	809.80	55.20	27.00	222.20	14.44	0.22	3.40

? Table 4? the highest values(after being demagnetized)

AVG.	BLR	E11	E21	E31	E12	E22	E32	TE32
1	866.0	807.0	53.0	28.0	236.0	13.7	0.1	3.0
2	872.0	815.0	54.0	29.0	218.0	14.4	0.1	2.0
3	875.0	815.0	54.0	27.0	217.0	14.0	0.1	3.0
4	874.0	813.0	55.0	28.0	218.0	10.6	0.4	4.0
5	863.0	807.0	55.0	28.0	223.0	11.3	0.0	0.0
AV	870.00	811.40	54.20	28.00	222.40	12.80	0.14	2.40

BLER: BLOCK ERROR RATE

The amount of BLOCK ERROR can be inspected by C1 within 1 second BLOCK

- The descriptions of respective ERROR CODES
  Correctable ERRORS in the STAGE of either C1 or C2 indicate
  E11---illustrates that C1 STAGE can correct 1 ERROR
  E21--- illustrates that C1 STAGE can correct 2 ERRORS
  E31--- illustrates that C1 STAGE can correct 3 ERRORS or above
  Uncorrectable ERRORS in C1 STAGE will be sent to C2 STAGE
  E12--- illustrates that C2 STAGE can correct 1 ERROR
  E22--- illustrates that C2 STAGE can correct 2 ERRORS
  E32--- illustrates that C2 STAGE can correct 3 ERRORS or above
  TE22: TOTAL of E22
  TE32: TOTAL of E32

■ Summary

After demagnetization, TOTAL of E22 and of E32 that seriously influence the tone quality will largely decrease.

E-22: the increasing difficulties of reading signals result from increased Jitter…

E-32: sound discontinuity results from entirely unreadable problem

6. Conclusion

According to the aforementioned descriptions, the effect of RD-2 demagnetizer can be assured by obtained Data. In general, perfect sounds cannot be obtained owing to NOISE interference in DISC Data prior to demagnetization. As a matter of fact, most AV lovers have been appreciating stained DISCS, which are not demagnetized by RD-2. Data of those stained DISCs read and replayed through a CD PLAYER, an AMP, or a SPEAKER will simply magnify defects without improving the original data quality.

Dear AVCD lovers, can you still stand "distorted image quality and tone quality" performed by your high-quality, valuable DISC apparatus without a move?

? **?**

Q&A

Q1: How long will the demagnetization effect last?

A1: It would be an ideal approach to apply RD-2 demagnetizer to a DISC prior to data reproduction each time, as each DISC after demagnetization may be more or less influenced by magnetism due to different magnetic field levels of the environment. In addition, too many reproduction times further cause a DISC to be gradually influenced by magnetic fields resulting from the recording head and motor rotations of a DVD/CD PLAYER.

However, over a 6-month span, there will be a clear difference of the reproduction result comparing DISCS prior to and after demagnetization without "disappearance of the demagnetization effect".

Q2: When would it be better to demagnetizing a CD-R or a MD to have the best result, before or after its recording?

A2: The best time is absolutely prior to the recording of a DISC. The difference is equal to the effect, which results from the recorded data comparisons between a low quality DISC and a high quality one. The result of utilizing a low quality apparatus for data recording with demagnetization by RD-2 demagnetizer will be much better than that of utilizing a high quality apparatus for data recording without demagnetization. Therefore, to perform the best recording result, it is better to demagnetize both original tape and a blank one before recording.

Q3: Why is that current demagnetizers (Head Eraser, Bulk Eraser…) are of little effect, fail to degauss, or even are counterproductive?

A3: It can be understood from appearances/shapes and operations of those demagnetizers that the front portion of demagnetization is too small to cover the range of a DISC, moreover, discontinuous demagnetization operation resulting from inaccurate power control further causes magnetism. RD-2 demagnetizer had been developed covering a comprehensive magnetism with a special COIL bigger than a DISC and controlled by a precise and automatic magnetic force system to attenuate the magnetic force to zero, which completely enables the magnetism removal. RD-2 demagnetizer, the indispensable demagnetization product for DISCS, has been patented in U.S.A., Japan, etc,. to enable DISCS to perform the best results.

Q4: Suppose that new DISCS are not influenced by magnetism, is it necessary to demagnetize those DISCS?

A4: It is without doubt that the data reproduction of a DISC after demagnetization assures the enhancement of the result, since completely new DISCS may probably be influenced by magnetism resulting from magnetic fields generated by various electronic equipment during production.