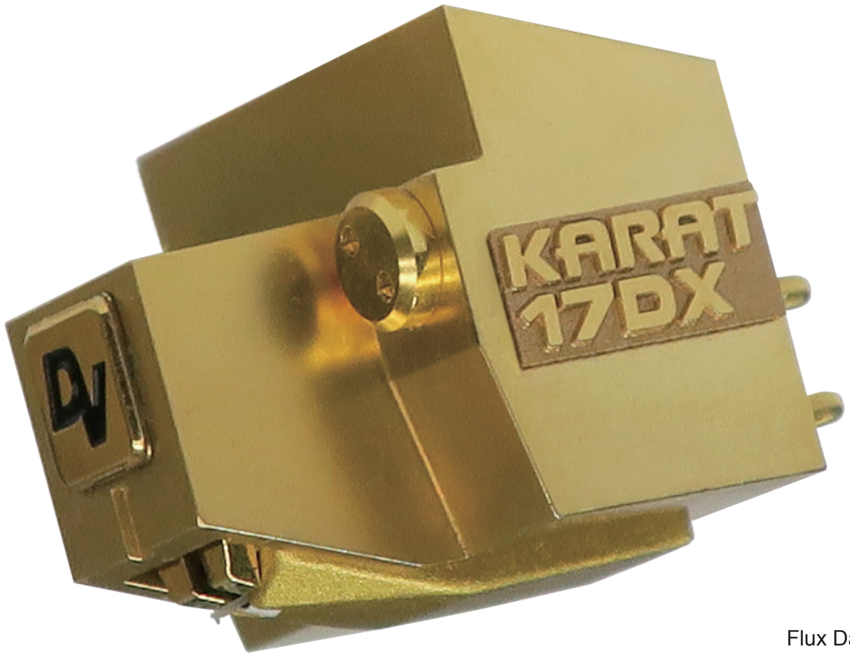
Dynavector Systems

Low Output Moving Coil Cartridge with diamond cantilever

KARAT 17DX



Flux Damper (patent)
Softened Magnetism (patent)

Design Concept

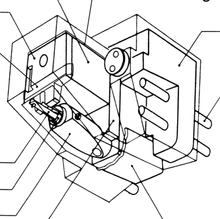
MC cartridge KARAT series is the world's first diamond cantilever model that continues from 1981. KARAT series is designed using 'dispersion theory' based on Vibration Engineering. The cantilever length is also very short, 1.7 mm, so 17DX can not be produced without long experience and advanced craftsmanship. Theoretically, 17DX with micro vibration system plays high frequency to near 100 kHz. The width and flatness of the playback frequency band outperform the latest digital media and any other cartridges.

In order to improve this historic cartridge, we tried many prototypes and studies in accordance with the excellent regeneration environment of modern times. As a result, we improved the reaction speed of the sound and the sound resolution.

So long as a company exists as an audio manufacturer, the perfect reproduction of the enormous heritage of music recorded on black discs is still one of the very important obligations. We are performing this difficult duty by KARAT 17DX.

New Brass Body

KARAT 17DX is developed while paying attention to main body material. As a result of many trial production, we decide to use a machined brass. It make the excellent frequency characteristics of the KARAT series further leap forward, high frequency range is improved without harshness. Furthermore, by changing the conventional neodymium magnet to a samarium-cobalt magnet with low magnetic resistance, we can realize a clear sound field reproduction with fast sound rise and high resolution.



Magnetic Circuit

KARAT 17DX is installing the flux damper and softened magnetism. By an addition of these two improvements, harshness or irritating edginess that is more or less common to MC cartridges has been eliminated.

Specifications

● Type : moving coil with flux damper and softened magnetism ● output voltage : 0.3mV (at 1 KHz, 5cm/sec) ● frequency response : 20 - 20,000Hz ● channel balance : 1dB (1 KHz) ● channel separation : 25dB (1 KHz) ● compliance : 15 mm/N ● impedance : 32 ohms ● stylus : small size Micro-Ridge Line contact ● cantilever : 1.7mm length solid diamond ● Tracking force : 1.8 - 2.0 grms ● recommended load impedance : >100 ohms ● weight : 11.0 grms

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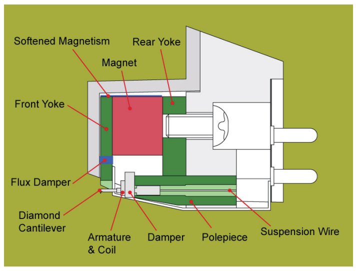
Technical Note of Dynavector MC Cartridges

Flux Damper



We focused on the magnetic interference that occurs between the movement of the amateur within the air gap of the magnetic circuit and the magnetic yoke surrounding it. So we discovered that the flux fluctuation caused a big influence to the reproduced sound.
Dynavector MC cartridge has a flux damper (patent) on the front yoke to eliminate this flux fluctuation. Because of this technology, magnetic flux fluctuation has drastically decreased compared with conventional MC cartridge. So no smooth and colored over the entire band has achieved a natural reproduced sound.

Softened Magnetism

In recent MC cartridges, high-energy rare-earth magnets such as samarium-cobalt magnets and neodymium magnets are used to increase the output voltage. However, adopting such a magnet is effective for improving the output of the MC cartridge, but the magnetic field in the air gap of the cartridge is easily affected because the magnetoresistance is extremely high. As a result, intermodulation or harshness becomes noticeable when reproducing the track of large amplitude sound.
In the Dynavector MC cartridge, this internal magnetic resistance is reduced by a unique method. So the stabilization of the magnetic flux within the air gap is remarkably improved compared with the conventional MC cartridge.

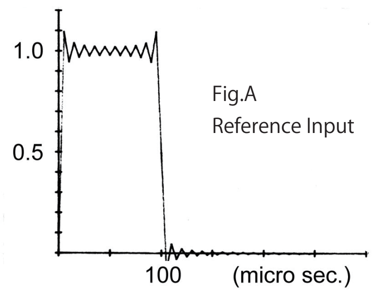
Dispersion Theory

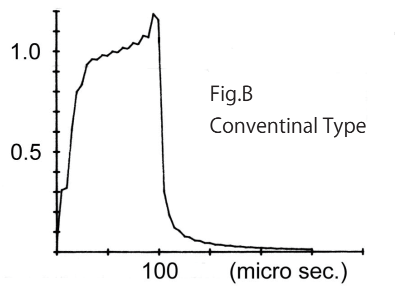
In order to convert the mechanical vibration from the record into the electric vibration, the input wave as the bending wave needs to propagate to the output side without distortion.
When this bending wave propagates through the cantilever, it has been known that the speed of the bending wave changes depending on the wavelength or frequency. This phenomenon is called dispersion.

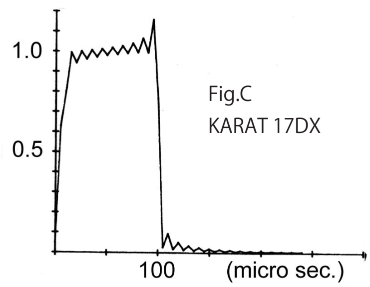
A signal composed of various frequency components like a music signal is regarded as a series of wave packets. The speed of the propagating wave packet depends on the frequency, and it will break its shape when propagating through the cantilever. Therefore, in order to faithfully reproduce the music signal recorded, it is necessary to improve the dispersion characteristics as much as possible.

The theory of dispersion on the cantilever vibration is unduly overlooked in the design of the high performance cartridges. These cartridges have marvelous frequency response in similarity but sound individually. This paradox can be analyzed only by the dispersion theory. Dynavector is the first and still only one company designing cartridges by both theory of dispersion and frequency response.

Since the debut of KARAT DIAMOND, we recognized the truth of the dispersion theory. And by the rapid advancement of the laser technology in these years, the more precise cutting and forming became possible. This condition made it easier and possible to produce the shorter diamond cantilever.







The effect of dispersion is shown by (A) is the input square waveform comprising harmonic frequency component up to 200th higher harmonic component. (B) shows the wave deformation by the dispersion in 7mm length conventional cantilever. (C) shows the effect of dispersion in 1.7mm cantilever of KARAT17DX. By shorter cantilever the smaller dispersion effect is recognized by these diagrams.

In summary, when sound is transmitted through a solid in the dispersion theory, the speed of transmission differs between high frequency and low frequency. As a result, the waveform is disturbed. For accurate transmission, use a shorter cantilever and a material with faster transmission speed.

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