

PRESS RELEASE
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Optical cartridge pioneer DS Audio releases details of its own technology to other manufacturers

Q Why is the phono equalizer circuit of the optical cartridge different from the phono equalizer circuit of MM / MC?

A Since the MM / MC cartridge is a speed-proportional type cartridge, the speed increases - the output increases as the frequency increases (Fig. 1). In the phono equalizer, the output change of the speed-proportional part must also be corrected for BIA correction, so the phono equalizer for the speed-proportional type requires a large correction (Fig. 2). On the other hand, the amplitude-proportional type cartridge outputs in proportion to the magnitude of the record groove amplitude irrespective of the speed, so it requires flat from high frequency to low frequency (Fig. 3). Therefore, the BIA phono equalizer curve required for amplitude-proportional type consists of a very simple circuit compared with the speed-proportional type phono equalizer curve (Fig. 4).

Q How to supply voltage to the cartridge?

A Power is supplied to the cartridge using the ground line (blue and green lines) of the main audio cable. Specifically, power is supplied to the LED by applying +5 V to the cartridge 4 pin green terminal and using the blue terminal as the ground. Since PD is driven with common line, a common line of 10 V is applied to the signal line.

Q Why do we need a filter in the ultra-low range? Why are there two outputs?

A Since the optical cartridge is an amplitude-proportional type cartridge, it will play back to DC (0 Hz) if nothing is done. If you play up to the DC range, the warp of the record and the resonance of the tone arm will be played back as it is, and there is a possibility that the music will be distorted. The speed-proportional MM / MC cartridge does not output much in the ultra-low range (because the coil works as a filter), so there is no problem, but in the case of the amplitude-proportional cartridge, it is necessary to remove the ultra-low range with a filter. For that reason, OUTPUT 1 has a filter of 0 dB / oct from 20 Hz, and OUTPUT 2 is flat to 40 Hz / oct + 20 dB to 12 Hz / oct.

Since 2013, DS Audio has been pioneering the world's only optical phono cartridges, which have earned rave reviews from the international audiophile press. Now, the company is blazing another unusual trail, by releasing details of its unique technology so that others can join the optical audio market.

When you lead the way in something that's described as 'the biggest game-changer in decades', typically, you patent it - or at least try to keep the competition at bay for as long as possible. Japanese DS Audio, however, is not your typical company.

Optical technology delivers what DS Audio considers to be a peerless approach to phono cartridge engineering, and CEO and chief designer Tetsuaki Aoyagi would like to see its benefits incorporated into many more high-end audio systems. To this end, rather than keeping the relevant knowledge and spoils to himself, he is publishing, free of charge, DS Audio's technology and expertise in order to help others enter the market. "My goal is that optical cartridges move from being 'unique' to 'popular'," he explains.

At present, DS Audio's optical cartridges require their own equalizer / phono stage, since the technology differs from that needed for a traditional MM or MC cartridge. In the future, Tetsuaki Aoyagi hopes that manufacturers of high-end electronics will begin to build in optical cartridge-friendly tech into their phono stage and amplifier designs, such that a separate unit is no longer necessary.

Circuit diagrams are now freely available on the company's website at www.ds-audio-w.biz/optical-cartridge-phono-equalizer-circuit-info

In addition, any manufacturer considering designing a phono stage compatible with optical cartridges is invited to contact DS Audio who will review the proposed design and answer questions, with no license or consultancy fee. Circuit diagrams and samples of the finished product can then be sent to DS Audio for final checking, after which details of the product will be published on their website as compatible with DS Audio cartridges.

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