

# Guidebook of Computer Hifi

Listening from Full Digital

Lead Audio LA-200 USB Digital Amplifier



## Guidebook of Computer Hifi: Lead Audio Digital Amplifier LA-200

There is no reason for listening to music using computers. Even though the audio stream is evidently flowing towards more and more usage of computers in the recent years, it certainly does not mean that it is the only way to enjoy music. No need to abandon your well-equipped AMP, speaker, CD player and buy a new audio set just for the computer. It will be hard, however, to ignore the desire for computer audios after listening to Lead Audio's new USB DAC AMP, LA-200. Different from the main system, easy to use (one does not have to turn on the audio and work the settings), anyone can work on the computer and comfortably listen to the music. I, the writer of this article, myself, felt the desire to have one set on my desk.

I have no intentions to stimulate customers' consumptions with pleasant words. This small digital AMP is far worthier than its price because the quality of the sound it creates is greatly beneficial given its price. I will now analyze LA-200's quality value.

### Denmark Originated Audio

This is a brief description of the product. Lead Audio's LA-200 has functions both for an USB DAC and an AMP. LA-200 is developed and designed by a Danish engineer, Søren Mac Larsen in the company Lead Audio ApS. He is highly experienced in areas of DSP, programming and digital circuits and has been working more in the pro-audio and DSP development fields than home-audio field. He was involved in the development of Copland's CD player and DRC with built-in DSP filter and DAC circuit design.



### Full Digital Processing Digital AMP

LA-200 is Søren's second work at Lead Audio. LA-200 is a digital AMP which was produced after his first product, USB DAC LA-100. LA-200 was developed based on his experience of making the first USB DAC, which allows it to have an expanded USB basis. Even though the manufacturer names LA-200 as DAC AMP, actually it is a Digital Amplifier. The difference between LA-200 and other USB-based amplifiers of similar sizes is that LA-200 is not the typical D class of switching AMP which amplifies Analog signal by switching mode but the pure Digital Amplifier which processes and amplifies all signals from input to speaker's final output in Digital mode.

Just for the note, unlike other similar products, Lead Audio focused on digital signal processing in LA-200 with lots of effort. They don't simply amplify the input digital signals. They made an effort to reduce the jitter

of signals (especially the USB input) *before* they were amplified. They adapted very exact clock circuit techniques, converted the digital signals to 192kHz/24bit by applying sample rate converter methods with self-buffering, and made sure there was no amplification of noise and artifacts prior to digital amplification through digital signal processing. This is the greatest difference between other mid-priced USB AMPs. Although it's an inexpensive AMP, Søren's high-end DSP experiences helped to realize such a product.

Fundamental inputs are digital signals such as optical, coaxial and computer USB, but there also is a standard analog input. Analog signal is A/D converted to 96kHz/24bit and is processed equally as other digital signals. Optical and coaxial signals can receive inputs up to 192kHz/24bit but USB can receive up to 48kHz/16bit. Lead Audio excuses that input signal is up-sampled to 192kHz/24bit internally so that the quality of sound is comparable to high resolution. But still, the fact that it cannot play signals of higher resolution than 96kHz with full specification is clearly a weakness (But it doesn't mean it can't play, it plays with 44.1kHz or 48kHz with down-sampling processing). The output level is 8ohms 24W and 4 ohms 14W. You might be disappointed with the numbers, but when you actually hear the quality, it will not be so. I will continue about this later.



## Dynamic Sound

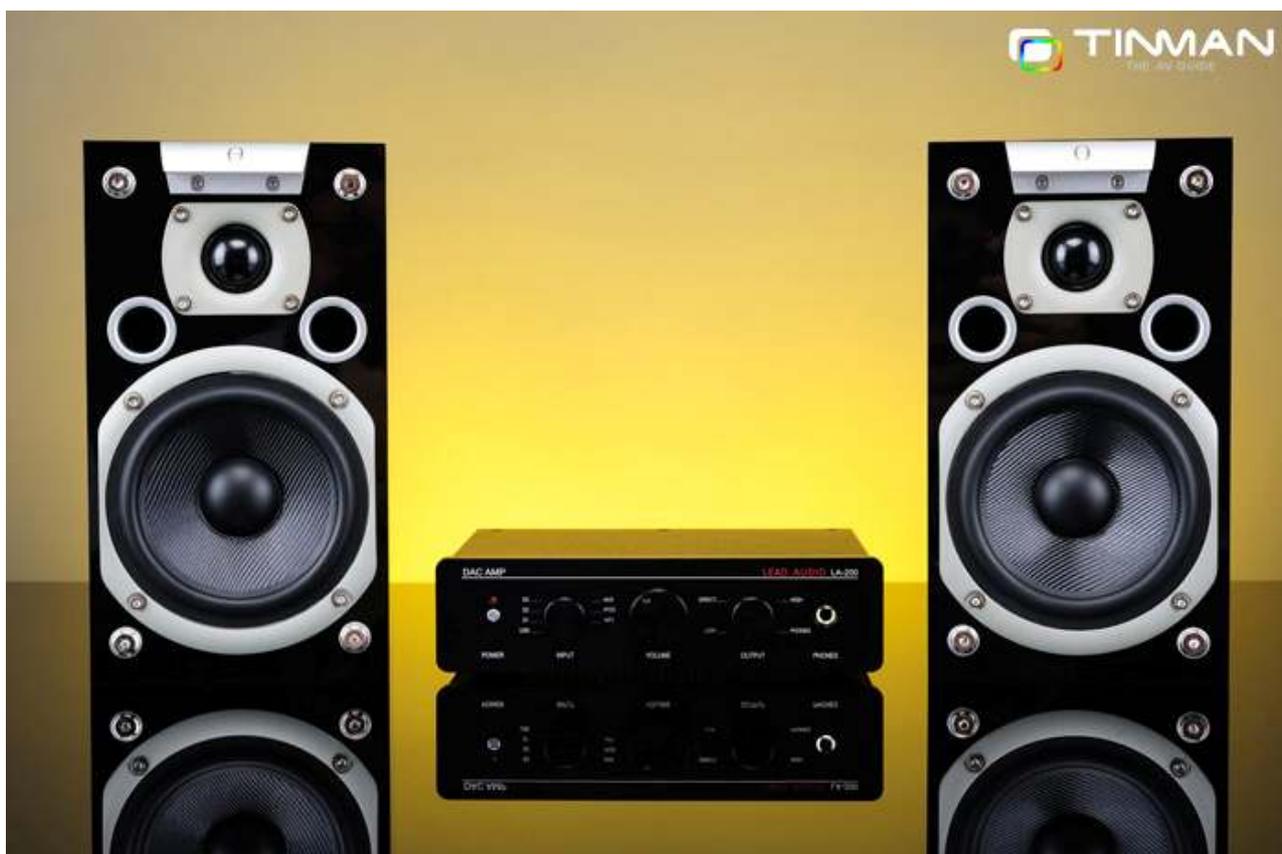
Test was executed with a bookshelf speaker K-1 which was designed by Audiovector. Compared to other bookshelf speakers, Ki-1's size, (height 26cm, width 14cm, length 22cm) allows one to casually place the speaker next to the computer screen, and its width and length are optimal. Despite its small size, the overall sensitivity is only 88dB. It can produce loud sound without difficulty. It relies more on the amplifier because its impedance specification is only 4ohm, but it absolutely has no problem because there is the LA-200 as the matching AMP for Ki-1 this time around.

I used the computer as the main source, and I used Transparent's USB cable for USB connection. So, the connection is as follows: Computer -> Transparent USB -> LA-200 -> Speaker Cable -> Ki-1.

The trait of the overall sound is bright and dynamic. The size might affect the depth of the sound, but you won't be missing anything as the speaker and LA-200 are for on-the-desk-uses. The speaker might use some aging because it's new, but its overall tone is bright and colorful. The sound never sank or went dull. Ki-1's advantage is that the sound is bright, crisp and without hesitation. Additionally, such brightness and openness of the sound does dull the sense of rough and stimulative edgy sound. Thanks to that, the density or the accent liven up and boosts the overall sound stage reproduction. It can be easily heard when you

listen to jazz like Carol Kidd or Junghyun Park's 4th, 5th albums. The sound creates an ambience of accurate sound and clear and organized background music which spread evenly to right and left. The sound comes straight to you so it feels as if you are enjoying the music using the headphones.

To determine the dynamics, I listened to Britain Orchestra produced by Reference Recording and Prodigy's electric sound for comparison. There was limitation to playing ultra-low frequency band because of the cabinet size and the limitations of the unit, but the overall orchestra's dimensional representation is impressive and the sound never became clouded. From ultra-low frequency to high frequency of string and brass, Ki-1 and LA-200 smoothly reproduce a lot of variable feast of sounds. Even though the speaker can't fully produce Prodigy's strong and edgy sound effects as much as the floor-standing speakers, it produces highest sound quality possible from bookshelf speakers. The best feature of Ki-1 and LA-200 package is that no matter how high the volume, the sound does not degenerate or become rough and coarse.



Then, is it the speaker or the AMP that affects the sound the most? Before answering the question, I changed the speakers to **Focal's Chorus 706V**, the sound became two times bigger and it was obvious this speaker does not have a single difficulty producing sound with 90dB sensitivity. Even though the size is bigger, the requirements for the AMP seems rather easier than Ki-1. With the change of speaker, the scale and width of the sound became clearly bigger and wider. The stability and the depth of the sound become deepened and more stable while response of bass doesn't lose its speed still. Especially, even though widen scale of stage and deepened depth are regarded as by virtue of the speaker, important point is that much improved sound can be realized by same Amplifier LA-200. The fact of reproducing bigger power, scale and resolution to fit to bigger speaker proves that potential of LA-200 was not fully expressed by K-1.

## Conclusion

Lead Audio's LA-200 is more expensive than other Class D amplifiers, but it is certain that LA-200 shows a completely different sound quality in terms of Digital Amplifier keeping full digital path. There is a risk a full digital amplification might become problematic by only producing digital artifacts, but LA-200 is on a whole new level by bringing out the digital advantages and strengths which Class D amplifier never shown. LA-200 completed clean, high quality digital amplification particularly through jitter and noise solution - unlike the existing USB amplifiers that could not filter computer noise. While reproducing high clarity, transparency and vibrancy from strength of digital solution, LA-200 realized dynamic sound. Especially by using Ki-1 as part of the package since the design phase, LA-200 creates pure integration of clean and transparent sound.



With about 600Euros, one could purchase low priced integrated amplifier, USB DAC and a small speaker. But with such combination, it will never be simple to pull off the full digital sound performance as from LA-200 and Ki-1. In addition, without having to consider and test sound match of various combinations of AMPs, DACs and speakers by trial and error, with LA-200 and Ki-1 can one simply and easily purchase two cables and enjoy transparent and dynamic sound. The affordable price and the modest size of the speaker and the digital DAC AMP is probably one ideal solution of computer hifi. The power consumption of only 5W is one other strength of green environmental Hifi.

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