

Title	高度感性情報再生に重要な物理要因の発見とその実現 - “ 力強さ ” 再生から発見したバランス伝送回路と C D 盤に重要な物理要因 -
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Discovering the Important Physical factors for  
Reproduction of High Order Sensation and Realization  
- The Physical factors of Balanced Circuit and Compact Disk  
Discovered from "energetic" -

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Quantity of Transparent Light, Mechanical Vibration

We have researched about advanced audio system that evokes deep sensations on the audience.

Although the audio systems have been advanced, the sound qualities of those systems aren't reaching the level of a live musical performance. Then, we have introduced High Order Sensation (HOS) that evoked deep sensation from music, so that reproduce HOS on the audio system. Moreover, we aim to develop the audio system that reproduces HOS with high fidelity.

The approach of this research is the following. At first, we clarify a relationship between psychological amount (sound quality) and physical amount (physical factor or characteristics). Namely, we change a physical amount on the new model of music reproducing, and clarify a relationship this physical amount and the psychological amount evoked by HOS. And then we search the important physical factor for HOS, and found it. Secondly, we introduce the new physical factor into the audio system and improve it. Finally, we realize the audio system that reproduces HOS. Actually, we have realized the audio systems that reproduced HOS pretty well.

## 英文要旨

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The psychological amount evoked by HOS is expressed by assessment words that are researched in the previous study about HOS. These are constructed in a tier. In this tier, "realistic" is the most important assessment word.

In this research, we have focused our previous audio system have not reproduced "dignity" in "realistic". According to expression on key assessment words of HOS, "dignity" is close to the psychological amount that satisfies both "Atmospheric" and "energetic".

On the ground of previous researches about HOS, Miyahara have come to build up two hypotheses. The following are two hypotheses.

[Hypothesis 1] Localizing the Sound Image by Precision of Time

[Hypothesis 2] Concentrating the Energy by Power Concentrated

If Hypothesis 1 is satisfied, "atmospheric" is reproduced. And if Hypothesis 2 is satisfied, "energetic" is reproduced. When both of them are reproduced, "dignity" is reproduced.

In this paper, we have researched about balanced circuit to reproduce "dignity" in the first place. On the other hand, we have researched about Compact Disk (CD) as an assessment sound source of psychological amount because the sound quality of CD changed in compliance with the characteristics.

In this paper, we have focused on the reproduction of "dignity". We have found that balanced circuits could reproduce "atmospheric". Thus, we have guessed that balanced circuit reproduced "dignity". In a preparatory experiment we have found that balanced circuit reproduce "atmospheric" but did not reproduce "energetic".

Accordingly, we have analyzed the relationship between the psychological amount ("atmospheric") and the physical amount (characteristics) on Amplifier. As the result, we have clarified that the Common Mode Noise Rejection Ratio (CMRR) is seriously related with the reproduction of "atmospheric".

And, we have discussed how to improve the reproduce of "energetic". Thus, we have researched why "energetic" was not reproduced. In consequence, we have found that Speaker Drive Ability by supplying current is seriously related with the reproduction of "energetic".

According to this research, we have realized the balanced circuit that reproduced not only "atmospheric" but "energetic".

On the other hand, we have focused on the characteristics of the CD. By preliminary

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experiments, we have found that the thickness of both aluminum layer and polycarbonate layer relates with the sound quality on HOS. Therefore, we have measured the error rate, the optical reflection rate, and the quantity of transparent light of CD. Especially, it has been clarified that the quantity of transparent light is about 10 times different between each tested discs and, it is also related with the sound quality on HOS strongly. In order to find that what is the essential to sound quality on HOS, we have made some test discs changing thickness of both polycarbonate and aluminum by unique stamper. And, we have discussed the relationship between the sound quality and (1) the quantity of transparent light, and (2) the mechanical vibration of disc.

According to this research, we have realized the CD that reproduced "energetic" pretty well.

As a result, we have advanced the audio system that reproduced HOS.