JAIST Repository

https://dspace.jaist.ac.jp/

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 -
Author(s)	藤本,桂一
Citation	
Issue Date	2002-03
Туре	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/1542
Rights	
Description	Supervisor:宮原 誠, 情報科学研究科, 修士



Japan Advanced Institute of Science and Technology

D iscovering the Im portant Physical factors for R eproduction of H igh O rder Sensation and R ealization - The Physical factors of Balanced C ircuit and C om pact D isk D iscovered from "energetic" -

Keiichi Fujim oto (910101)

School of Inform ation Science, Japan A dvanced Institute of Science and Technology February 15, 2002

Keywords: High Order Sensation (HOS), High Fidelity, "dignity", "energetic", "Atmospheric", Balanced Circuit, Speaker Drive Ability, Compact Disc (CD), Quantity of Transparent Light, Mechanical Vibration

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

A lthough the audio system s have been advanced, the sound qualities of those system s aren't reaching the level of a live musical performance. Then, we have introduced H igh O rder Sensation (HOS) that evoked deep sensation from music, so that reproduce HOS on the audio system. M oreover, we aim to development the audio system that reproduces HOS with high fidelity.

The approach of this research is the follow ing. At first, we clarify a relationship between psychological am ount (sound quality) and physical am ount (physical factor or characteristics). N am ely, we change a physical am ount on the new model of music reproducing, and clarify a relationship this physical am ount and the psychological am ount 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. A ctually, we have realized the audio systems that reproduced HOS pretty well.

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". A coording to expression on key assessment words of HOS, "dignity" is close to the psychological amount that satisfies both "A tm ospheric" and "energetic".

On the ground of previous researches about HOS, M iyahara have come to build up two hypotheses. The follow ing are two hypotheses.

[Hypothesis 1] Localizing the Sound Im age by Precision of Time

[Hypothesis 2] Concentrating the Energy by Power Concentrated

If H ypothesis 1 is satisfied, "atm ospheric" is reproduced. And if H ypothesis 2 is satisfied, "energetic" is reproduced. W hen 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 "atm ospheric". Thus, we have guessed that balanced circuit reproduced "dignity". In a preparatory experiment we have found that balanced circuit reproduce "atm ospheric" but did not reproduce "energetic".

Accordingly, we have analyzed the relationship between the psychological amount ("atm ospheric") and the physical amount (characteristics) on Amplifier. As the result, we have clarified that the Common M ode Noise Rejection Ratio (CM RR) is seriously related with the reproduction of "atm ospheric".

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 D rive A bility by supplying current is seriously related with the reproduction of "energetic".

A coording to this research, we have realized the balanced circuit that reproduced not only "atm ospheric" but "energetic".

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

英文要旨

experiments, we have found that the thickness of both alum inum 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 alum inum by unique stam per. And, we have discussed the relationship between the sound quality and (1) the quantity of transparent light, and (2) the mechanical vibration of disc.

A coording 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.