



[Press Release]

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## **NHK develops 3D sound 22.2 multichannel headphone processor**

**- Achieving efficient Super Hi-Vision sound production -**

NHK developed the first headphone processor in the world to provide 22.2 multichannel sound\*, which can be used together with ordinary headphones. The headphone processor enables users to enjoy high fidelity 3D sound coming from the front, rear, right, left, above and below.

NHK has been conducting research and development for Super Hi-Vision (SHV)—the next-generation television, which provides viewers with more realistic images and sound than existing Hi-Vision (HDTV) broadcasting. SHV has a 22.2 multichannel sound system that realizes a more natural surround-sound effect than the current 5.1 channel surround system.

To hear 22.2 multichannel sound accurately required going to a studio equipped with a large number of loud speakers. This made it impossible to instantly monitor the sound captured at a TV relay site, forcing production crews to bring the recordings back to the studio and reducing the efficiency of program production.

Humans can gain a natural impression of the sound by capturing the sound heard from various directions with our right and left ears. By measuring in advance the way the sound travels from the audio source to the human ear (referred to as “head related transfer function”\*\*) and inputting these values into the newly developed headphone processor, we have been able to reproduce the spread of the 3D sound of 22.2 multichannel sound precisely in headphones.

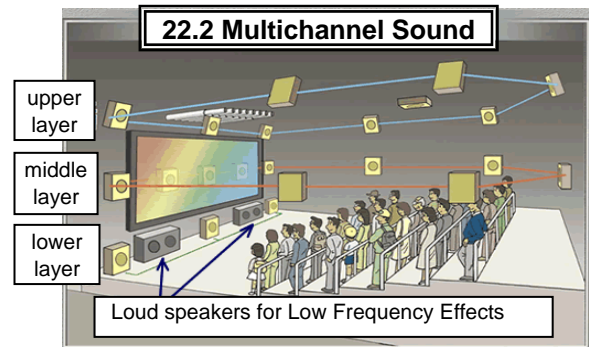
With the newly developed headphone processor, we can reproduce the 22.2 multichannel sound without much effort in a relay van, which no longer needs to be equipped with so many loud speakers, so TV programs can be efficiently produced on location.

The new headphone processor is being displayed at the NAB (National Association of Broadcasters) show in Las Vegas, April 20 - 23. Experience the spread of 22.2 multichannel sound through headphones.

## \* 22.2 multichannel sound

The 3D sound system being developed as the sound system of the Super Hi-Vision. It achieves 3D sound by using three layers of speakers, with nine channels in the upper layer, ten in the middle layer, three in the lower layer, plus

two-channel Low Frequency Effects (LFE) loud speakers. This system reproduces sounds beautifully with high fidelity not only from the front and back, and right and left, but also from above and below. The system is standardized as the SMPTE2036-2-2008.



## \*\* Head related transfer function

Humans perceive sound direction using both ears. The factors for judging sound direction include differences in the strength and time lag of the sounds reaching the right and left ears as well as variations in tonal quality due to individual differences in the shape of the head or ears. The function that mathematically expresses these factors is called the "head-related transfer function (HRTF)." The newly developed processor uses the values measured in advance.



Measurement for inducing head-related transfer function

(Reference)



Newly developed 22.2 multichannel headphone processor