

Release of HDTV Transmission System Using 60-GHz-band Radio Signals for Broadcasts from the 2006 Olympic Winter Games in Torino

The 20th Olympic Winter Games (Torino 2006) commenced on February 10, 2006. The NHK Science & Technical Research Laboratories has used past Winter Olympics as a venue to debut a number of technologies it has developed, such as an "in-ice" microphone system, which picks up skating sounds, and a "virtual competition" system, which superimposes the images of speed skaters racing in previous heats over the current race for comparison. For the Torino 2006 Games, we prepared an HDTV transmission system using 60-GHz-band radio signals for the international signal* productions of the speed-skating competition.



Figure 1: A rail camera

To capture a sense of the skaters' speed, footage was shot with a camera that travels on a rail installed around the rink. As the skaters race, the camera moves alongside them. STRL cooperated with the NHK Broadcast Engineering Department to construct a wireless system to transmit uncompressed HDTV signals from the camera. This system is free of camera-image delay, thanks to its uncompressed signal transmission ability, and can seamlessly switch between multiple cameras at the site in Torino, Italy.

* International signal: The Olympic Organizing Committee requested that official competition video be produced by major broadcasters from different countries. NHK is the only broadcaster in Japan entrusted with this responsibility.

HDTV transmission system using a 60GHz-band radio signal

This system wirelessly transmits an uncompressed digital HDTV signal over the 60-GHz band.

<Features>

-HDTV video transmission with no delay

While ordinary wireless HDTV transmissions are in the UHF or microwave bands, these bands require signal compression due to their narrow frequency bandwidth, and the compression process results in a delay. In contrast, the 60-GHz band is very broad, and this makes it feasible to transmit uncompressed HDTV signals without a delay.

-Stable reception with diversity reception

Indoor mobile reception is prone to bit errors due to significant fluctuations in reception signal levels caused by interference waves reflected from wall and floor surfaces. The broadcasts from Torino benefited from a diversity reception scheme that selects the best signal from the three receivers installed at the reception points shown in Figure 3. The diversity reception scheme enable stable HDTV video transmissions throughout the entire rink, including the curved segments.



Figure 2: Receiver (for curved segments)

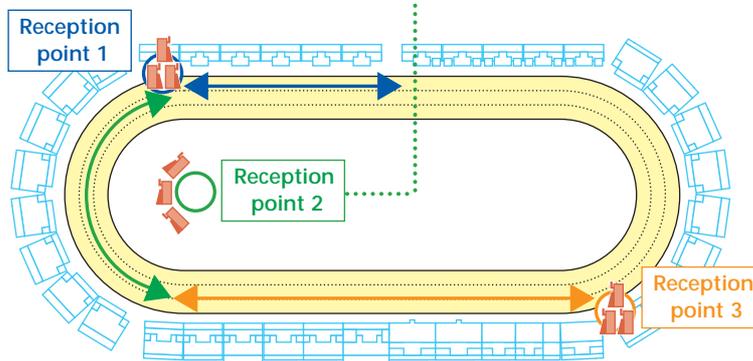


Figure 3: Reception point arrangement

First-ever Abroad! Super Hi-Vision (SHV) Exhibition

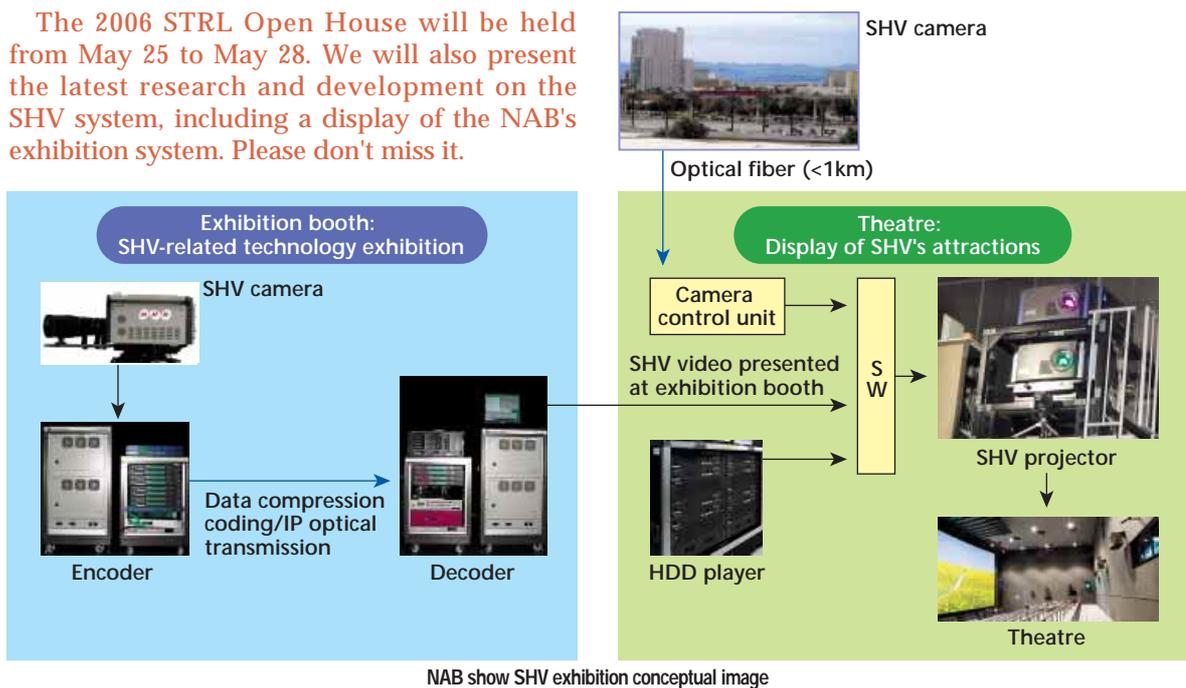
NHK is conducting R&D on a future television system called Super Hi-Vision (SHV), which consists of ultrahigh-definition video with 4,000 scanning lines and a 22.2 multi-channel audio system. During the past year, SHV programs were shown in a theater at the 2005 World Exposition and at the Kyushu National Museum Theater, and a live relay experiment involving uncompressed optical transmission of SHV was conducted for the first time in the world. There was also a simultaneous broadcast of the variety entertainment program, Kohaku Utagassen, in SHV to a temporary theater erected for the occasion.

Now SHV is set to be shown for the first time overseas. NHK received an invitation from the National Association of Broadcasters (NAB), which took note of STRL's technology, to participate with other organizations* in holding an SHV exhibition at the NAB show that will take place in Las Vegas, Nevada in the United States between April 24 and April 27, 2006.

The NAB exhibition will allow visitors from around the world who work in the broadcasting field to experience a dynamic SHV video presentation. The visitors will experience a heightened sensation of reality that SHV conveys in a 70-seat theater with a 400-inch screen. We will present live images of Las Vegas from the rooftop of the convention center, as well as a video program created for the 2005 World Exposition.

In addition, an exhibition booth next to the theater will introduce visitors to the cutting-edge SHV technologies. On display will be an SHV camera system, display system, recording system, and an encoding system. We will also attempt the world's first SHV IP optical transmission demonstration, which will combine an encoder and an IP optical transmission system. STRL will strive towards the realization of this futuristic television system.

The 2006 STRL Open House will be held from May 25 to May 28. We will also present the latest research and development on the SHV system, including a display of the NAB's exhibition system. Please don't miss it.



* Joint exhibition with the Nippon Telegraph and Telephone Corporation, and companies that have been working on SHV systems, Micron Technology, Inc., Fujinon Corporation, IkegamiTsushinki, Co., Ltd., Astrodesign, Inc., Keisoku Giken, Co., Ltd., and Victor Company of Japan, Limited.

NICT R&D on Multimedia Browsing Technology for the Visually Impaired Begins

NHK has been researching "human-friendly" broadcasting services that will enable those with physical limitations, such as elderly viewers and the visually impaired, to enjoy services equivalent to those enjoyed by the general public. Although these "human-friendly" broadcasting services include ones specifically produced for people with physical impairments, such as closed-captioning or commentary broadcasting, there is also research and development underway to make regular general broadcasting content available for the visually impaired audience.

One such project is the National Institute of Information and Communications Technology's (NICT) research on multimedia browsing technology for the visually impaired, which began in November 2005. NICT is conducting this project together with IBM and the University of Tokyo, and it has the goal of constructing a broadcasting-communication information environment in which people with visual impairments can enjoy not only broadcasting services, but also Internet services.

<What Does the STRL Approach Include?>

STRL has constructed various systems to make data broadcasting available for people with physical impairments. These systems include a data read-out system with a computer-generated voice and a tactile information display terminal using Braille. To represent information on such display terminals, semantic data is necessary in addition to the regular broadcasting content - for example, a "sun symbol" in a weather forecast have to be annotated with a semantic description indicating a 'sunny day'. This project will develop a new common description language for broadcasting and communications, called "XML* for the visually impaired," that contains such essential semantics information. We will also develop the technology to convert content from both broadcast and communication channels into the description language available on these terminals.

With the view to constructing an environment in which anybody, including the blind, those with poor vision, and those who are both deaf and blind, can enjoy a diverse range of broadcasting content, we will seek optimum display methods according to the degree of impairment. This will be done through research on an enlarged display, which would be an easier-to-see screen for people with poor vision, and through the presentation of visual information from graphs and diagrams in a tactile format, together with conventional sound and Braille presentations.

We are promoting such research with the hope of realizing an information platform in which broadcasting and Internet services can be easily enjoyed on a PC-type receiver connected to display devices designed for overcoming individual impairments.

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* XML (eXtensible Markup Language) : a language that describes the meaning and structure of a document.

