

# Topics From Within

## 3-HDTV Panorama Video-Transmission Experiment

### - Satellite Stadium Experiment -

The Communications Research Laboratory (CRL) and the Electronics and the Telecommunications research Institute of Korea (ETRI) have been conducting the Korea-Japan high data rate satellite communications experiments since February 2000. In the last phase of these experiments, two high-definition (HD) video transmission experiments using satellite links were carried out during the 2002 World Cup held in Korea and Japan. A 3-HDTV panorama-video-transmission experiment, proposed by Japanese group, and a three-dimensional (3D)-HDTV video-transmission experiment, proposed by Korea group, were carried out. This paper reports only 3-HDTV panorama-video-transmission experiment -called the “Satellite Stadium experiment”. This experiment transmitted an image of the whole soccer pitch to a screen constructed with three HDTVs placed horizontally at an aspect ratio of 9:48. Many organizations, such as the Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT), and the Digital Content Association Japan (DCAj) collaborated with CRL in this experiment

The setup of the Satellite Stadium experiment is shown in Figure 1. A 3-HD panorama camera developed by DCAj, was installed at the World Cup stadium. First, the whole pitch image was divided into three HD images (left, center, and right) by prism, and each image was MPEG-coded. The image signals were then multiplexed by TS-MUX and transmitted.

The images from the stadiums in Korea were sent to ETRI via an optical-fiber network and transmitted to the KOREAST-3 Ka-band transponder by means of a Trellis-coded 8PSK scheme, and the transmission rate at the satellite link was 155 Mbps. The downlink signal was received at the CRL’s Kitakyushu station and sent to CRL Kashima via the Japan Gigabit Network (JGN). In the case of the stadiums in Japan, a transportable station with a 2.4-m antenna was set up at the stadium and the signal was transmitted to CRL Kashima via the N-STAR Ka-band transponder. Because the 2002 World Cup was held in the rainy season and Ka-band communication suffers from rain attenuation, optical fiber networks were allocated for backup.

At CRL Kashima transmitted via the N-STAR Ka-band transponder to the Yokohama International Media Center (IMC), which was equipped with a 16-m-wide screen (see

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Figure 2). The signal was also distributed through an optical-fiber network to TEPIA Aoyama (16-m-wide) and MPHPT (11-m-wide screen). In the demonstration hall, the received signal was decoded and projected on the panorama screen by three HD projectors.

The Satellite Stadium experiments were successfully carried out for eleven games (three games in Korea and eight games in Japan) and generated great excitement.

The authors wish to thank everyone who participated in the Satellite Stadium project.

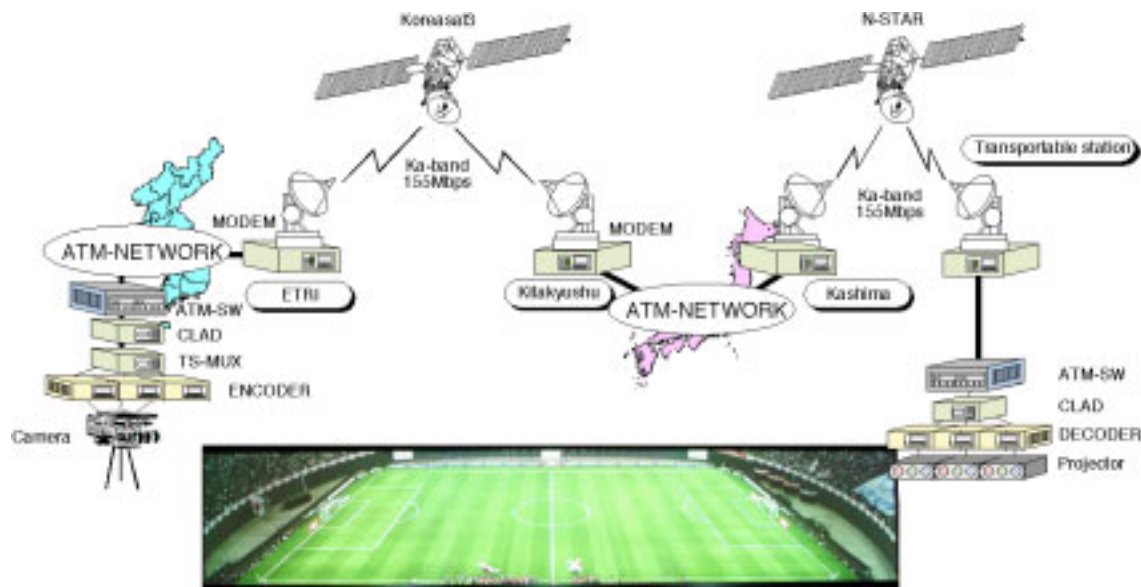


Figure 1. Setup of the Satellite Stadium.

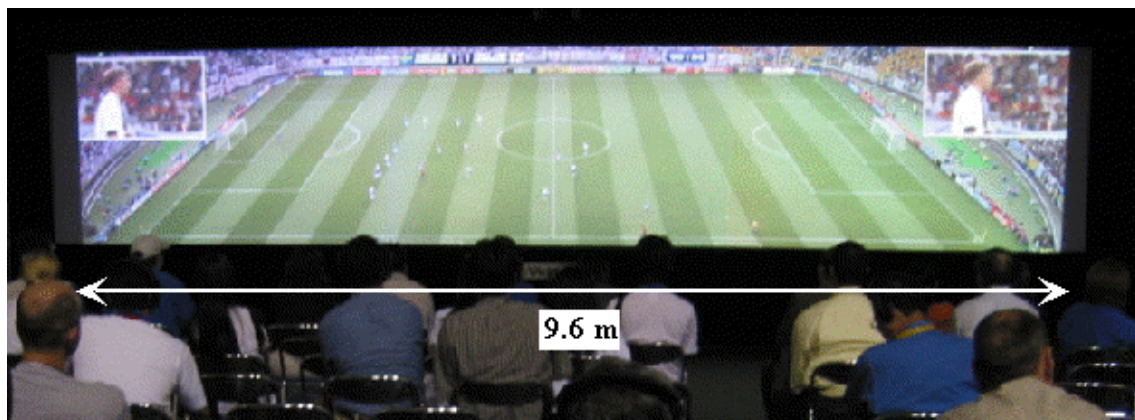


Figure 2. The panorama screen at the IMC.