This zone introduces the future image that STRL is drawing toward NHK's vision on "Creation of broadcasting and services that lead the new possibility".

**A  New Development of Super Hi-Vision**
August 1st, 2016, will mark the start of 8K and 4K Super Hi-Vision test satellite broadcasting in Japan. We plan to begin satellite broadcasting by 2018 and achieve widespread adoption by 2020, the year of the Olympic and Paralympic Games in Tokyo, while we continue our attempts to bring an even better, full-featured Super Hi-Vision to the world.

**B  Internet Technology for Future Broadcast Services**
The Internet is adding a whole new dimension to our lives with new services and possibilities. We at STRL are working on technologies to bring the broadcasting and the Internet together, creating newly evolved "television" services that assist and enrich our everyday lives.

**C  Smart Production**
We are working on technologies such as video and speech recognition along with big-data analysis to immediately and accurately convey a wide range of societal information, and various accessibility technologies that aim to provide information to every member of the society including those with differing needs.

**D  3D Television**
We have been working on developing three-dimensional television that can be enjoyed without special glasses. Our research includes improving video systems, establishing quality evaluation technology, and creating higher performance display devices.
**A1 8K-HDR Live Program Production**
We have developed an HDR television technology that expands the range of brightness that can be shown in TV images, with the aim of using it for 8K Super Hi-Vision broadcasting. This exhibit presents live program production using 8K cameras, an 8K display and an 8K program production system that support the HDR television standard.

![8K-HDR cameras](image)

**A2 Developments Toward Full-featured Super Hi-Vision**
We are developing production equipment for full-featured 8K Super Hi-Vision. This exhibit demonstrates an example of a production system using equipment supporting 120-Hz frame frequency, which we have developed while considering compatibility with HDTV production systems and the conventional timecode.

![120Hz-compatible 8K Production Equipment](image)

**A3 Full-resolution Single-chip 8K Camera System**
We are conducting research to achieve a practical 8K Super Hi-Vision camera. We have developed a portable camera system that can capture full-resolution (RGB 4:4:4) 8K video with 33 megapixels each for red (R), green (G) and blue (B) by using a single image sensor.

![Full-resolution single-chip 8K camera](image)

**A4 Holographic Memory for Archival Use**
We are conducting research on high-density holographic memory for the long-term archiving of 8K Super Hi-Vision video. This exhibit displays a holographic recording prototype drive equipped with a technology to improve the quality of reproduced data and presents a reproduced video of compressed 8K signals recorded on its disk medium.

![Holographic memory drive](image)

**A5 Three-dimensional Sound Production Equipment**
We are researching technologies to produce high-quality 22.2 multichannel sound (22.2 ch sound) more easily in preparation for 8K broadcasting. This exhibit presents a new upmixing preprocessor as well as a 3D reverberator and loudness meter with enhanced functions.

![Three-dimensional sound system audition booth](image)

**A6 Retransmission Technology of Super Hi-Vision Satellite Broadcasting for Cable TV Networks**
We are studying ways to distribute Super Hi-Vision (8K/4K) satellite broadcasting to homes on cable TV. This exhibit presents a system for retransmitting 8K satellite signals on cable TV by using a channel bonding technology that is compliant with both domestic and international standards.

![Retransmission of 8K satellite broadcasting on cable TV networks](image)
**A7 8K/4K Video Coding System with Super-resolution Reconstruction**

We are conducting research into a high-efficiency video coding technique for the simultaneous service of video with different resolutions. The use of super-resolution reconstruction technique enables accurate 4K-to-8K interlayer prediction. This will achieve the simultaneous service of 8K and 4K video simply by sending a small amount of supplementary data together with the compressed 4K video.

**Poster Exhibit**

A-P2 Future Video Coding Technologies
A-P3 Super-resolution Technique for Full-featured 8K Video

**A9 Delivery Technology Using MMT for 8K Super Hi-Vision**

We are continuing research into 8K Super Hi-Vision delivery technology using MMT. This exhibit presents a shared receiver that can receive programs transmitted through either broadcasting or broadband. It also presents MMT-based advanced services and 8K multichannel delivery technology using future broadband such as optical fibers supporting up to 10 Gbps transmission.

**A10 8K Super Hi-Vision Wireless Links for Program Contribution**

We are developing wireless transmission equipment (FPU) for live broadcasts of 8K Super Hi-Vision. This exhibit shows FPUs that use radio waves in the millimeter-wave and microwave frequency band and also 8K transmission technology for implementing an FPU system for mobile relay broadcast programs.

**8K Super Hi-Vision Theater**

The Rio Olympic Games will take place in August this year. Since the debut of our 8K Super Hi-Vision camera on the world's sporting stage in the 2012 London Olympic Games, 8K Super Hi-Vision has progressed hand in hand with many sporting events including the Sochi Olympic Games, FIFA World Cup and Wimbledon Championships. Presented here is a digest of 8K sport content that NHK has captured to date. Enjoy the sense of energy and enthusiasm of sports through the 33-megapixel ultrahigh-definition images with 22.2 multichannel sound.

**Experience Zone**

T1 Experience Full-featured 8K Super Hi-Vision

Come and experience our full-featured 8K Super Hi-Vision system having images with high resolution, wide color gamut, high dynamic range (HDR), high bit depth, high frame rate, and three-dimensional sound.

**Experience Zone**

T2 Immerse Yourself in a 3D Sound System

Full-featured 8K Super Hi-Vision provides the three-dimensional sound environment created by the 22.2 multichannel system, which gives us an immersive experience like never before. Another unique function of Super Hi-Vision that we are introducing is greater ability to enhance the audibility of dialogues.
Open House

Internet Technology for Future Broadcast Services

B1 Technologies to Realize a "New Television Experience" Spread by the Internets
We are conducting R&D on a "new television experience" closely related to everyday life by making the best use of Internet technologies. This exhibit shows technologies to provide programs and information in accordance with various scenes in the user's daily life based on data on their viewing environment and behaviors.

B2 New User Experience by Hybridcast for Live Sport Program
Toward higher functional Hybridcast, we are researching technologies to synchronize Internet delivered content with broadcast programs. This exhibit presents an example of how we can offer multifaceted viewing experiences of live sports coverage. You will see how the synchronized presentation makes it more attractive by displaying various information along with the broadcast program through the use of tracking data.

B3 Video Distribution Technologies Adapted to Diverse Viewing Style
We are conducting research into stable delivery techniques for Internet video services. This exhibit presents distribution technologies for smooth video reproduction in diverse viewing styles that include various devices (e.g., TV, PC, smartphone), different places (home vs outside the home), and different viewing timings (real-time viewing vs time-shift viewing).

Poster Exhibit
B-P1 Encryption Scheme for Privacy Protection
B-P2 Content Search Behaviors on Time Shift Zapping System

Smart Production

C1 Scene Text Detection to Automatically Generate Metadata for Videos
To make it easier for producers to find the desired footage, we are working on a system to automatically generate metadata for video materials. Our exhibit illustrates how we can detect text from signboards and nameplates that are included in videos by chance.

C2 Studio Robot for Joint Performance with CG
Our new studio robot helps to improve production featuring live performers and CG (computer graphics) counterparts. It has a light sensor and a motion sensor enabling more integrated video composing with lively interaction between the performers and CG characters.
C3 Automatic Sign Language Animation System to Express Weather Warnings
We are developing an automated sign language animation generator that provides weather warnings based on XML codes distributed by the Japan Meteorological Agency. In addition to regular weather forecasts, our system automatically picks up updates of local weather warnings and generates the corresponding sign language.

C4 News Service with Reading Assistance
To help non-Japanese viewers and language learners understand our news, we are working on a system that automatically supplements our news texts with simpler Japanese expressions or vocabulary translated into other languages, such as Korean.

C5 Haptic Presentation Technology for Conveying 3D Shapes of Object
To make "tactile" or touchable television a reality, we are continuing our research on technology to convey the shapes and firmness of physical objects such as works of art. Our newest development recreates the shapes of objects virtually by letting the user "touch" computer-generated images with their thumb and two fingers.

C6 Three-dimensional Information Analysis for Live Sports Graphics
We are working on new technology combining multi-viewpoint video with computer graphics to provide an entirely new sports viewing experience. The exhibit shows camera calibration technology that achieves to obtain information including the positions and orientations of multiple cameras in real time, and object tracking technology using both 2D image analysis and 3D motion prediction.
3D Television

D1 Integral 3D Television
As part of our research on integral 3D technology that will allow viewers to see convincing three-dimensional images without special glasses, we have created an improved 3D displaying device by combining multiple projectors. We have also developed a new technology to capture 3D images of objects positioned over a wider area.

D2 Device Technologies for Future 3D Display
We are working on creating three-dimensional displays that viewers can enjoy without special glasses. Our exhibit introduces two types of displays, one is the spatial light modulator driven by spin-transfer switching (spin-SLM) that enable a wider viewing zone in holographic displays and the other is the optical beam steering device for lensless integral displays.

Experience Zone
T4 Let’s Move and Watch! Integral 3D Quiz
Integral 3D television allows viewers to view natural 3D images without using special glasses. Here’s a video quiz making use of a major feature of integral 3D television, the ability to change the 3D image according to the viewer’s viewing position. You can’t see the answer from the front, but you can see it by changing your position.
**E1 Future Image Sensor Technologies**

We are refining our imaging devices to improve current 8K Super Hi-Vision cameras and help develop future three-dimensional cameras. This exhibit introduces our latest achievements in imaging devices.

**Poster Exhibit**

*E-P1 Solid-state Image Sensor Overlaid with Photoelectric Conversion Layer*

*E-P2 Organic Image Sensors*

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**E2 Elemental Technologies for Sheet-type Displays**

In order to create lightweight, ultra-thin 8K displays, we are working on elemental technologies to extend their lifetime, increase the screen size, and improve video image quality.

**Poster Exhibit**

*E-P3 Solution-processed Oxide TFTs (Thin-film Transistors)*

*E-P4 Inverted OLED (Organic Light-emitting Diode)*

*E-P5 Driving Technology for Enhanced Video Image Quality and Longer Lifetime*

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**E3 Magnetic Nanowire Memory**

We are proposing a magnetic nanowire memory architecture for a future high-speed recording device. On exhibit is our prototype performance evaluation tool. We explain how magnetic nanowires are used to record, store, and reproduce information.

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*Prototype of a magnetic nanowire*
**NHK Engineering System**  
**F1 Utilization and Development of NHK’s Technologies**

NHK Engineering System, Inc., promotes NHK’s patents and other technical expertise and engages in R&D aimed at sharing the benefits of broadcast technologies with the general public. Our exhibit includes some of patented NHK's transferrable technologies and ongoing research that are available for wider use.

**Engineering Administration Department**  
**F2 Live Streaming Service for Smartphones**

More and more people are using smartphones as the main device for viewing of images. In preparation for new services in the "smartphones first" era, in which viewers first watch programs on their smartphones, we have developed applications to realize program interactions with closed captioning, time-shift playback, SNS and TV.

**Engineering Administration Department**  
**F3 The Time Has Come to Launch Super Hi-Vision Broadcasting**

The test satellite broadcasting of Super Hi-Vision will start on August 1. This exhibit displays the reception equipment for Super Hi-Vision to show you how the service is received at home and to introduce our efforts towards achieving widespread use of the service. We are also open to any questions that you may have regarding digital broadcasting.

**NHK Museum of Broadcasting**  
**F4 IEEE Milestones Awarded for NHK’s Technical Achievements**

IEEE milestones recognize significant international technical achievements that were put into practice at least 25 years ago in the fields of electrical and electronic technology. In addition to the milestone for direct satellite broadcasting services awarded in 2011, this exhibit presents our recent awards for Hi-Vision and emergency warning broadcasting system.