Stage without Frontiers
Sennheiser MOMENTUM, AVX, guidePORT and 2000 Series wireless systems help shape artistic perspectives in Hopscotch, the world's first opera for cars

Los Angeles, California, USA, October 25, 2015 – October 31 will see the world premiere of Hopscotch, the world's first opera for cars. Using the city of Los Angeles as its backdrop, the latest project of experimental opera company The Industry takes place inside and outside 24 limousines and along three separate routes. Hopscotch uses audio technology from Sennheiser to vividly convey the storyline.

Hopscotch doesn’t mark the first time The Industry has collaborated with Sennheiser to realize its artistic vision. Two years ago, the LA-based opera company made international news with Invisible Cities — the first large-scale opera for wireless headphones, a finalist for the 2014 Pulitzer Prize in Music and the subject of an Emmy-winning documentary.

The Industry’s Artistic Director Yuval Sharon — who is featured in Sennheiser's MOMENTUM project which introduces exceptional and talented artists from all over the world that push the boundaries of sound — reaches for a daunting scale with his new project Hopscotch. The opera, which consists of 36 chapters or 'scenes', sees performances of over 100 singers, actors and dancers both inside outside the vehicles, all spread across the city of Los Angeles and connected to each other and audience members using Sennheiser audio technology.

Four core audio technology elements from Sennheiser have made Hopscotch possible: these include its MOMENTUM headphones and its guidePORT wireless audio guide system; Sennheiser's AVX digital wireless microphone systems and its 2000 series wireless microphones and wireless monitoring systems, in addition to dozens of headset and lavalier microphones. All of the wireless audio for the production is being transmitted to and from any of the 24 limousines, which are each provisioned with either camera microphone systems in the interior and/or professional
rackmount wireless systems hidden in the trunk. Additionally, in one scene, there are three rooftops, which transmit and receive audio up to a quarter mile away from one another.

Meanwhile, at the Central Hub — an interactive pop-up technology sculpture located in the parking lot of Southern California Institute of Architecture in downtown Los Angeles (SCI-Arc) — audience members are able to 'dial in' via Sennheiser's guidePORT system and MOMENTUM 2 headphones and listen to any of 24 giant monitors for the duration of the opera, each transmitting audio and video from a different limousine scene in real-time. The live-stream of the performances creates a dizzying panorama of life in Los Angeles, allowing each audience member in the Hub to experience the work their own way, sharing a personal slice of the huge shared journey.

**Limousine interior: Relax, it's an AVX**
The A/V 'star' of Hopscotch is Sennheiser's new AVX digital wireless microphone system, which discreetly captures ambient audio in ten different limousines and sends this back to the Central Hub. Typically, lavaliere microphones are 'planted' in the limousine's ceiling, under a table, or beside a seat and plugged into an AVX wireless belt pack transmitter. This transmitter then sends the signal to a nearby receiver, which is plugged into a smartphone/camera. The smartphone then sends the A/V signal, including the Sennheiser digital wireless audio, to the Central Hub via carrier signal using the Livestream broadcast application.

"Hopscotch challenges our traditional notion of the operatic art form, enabling audience members to become active participants," commented Achim Gleissner, Head of Commercial Management, Broadcast & Media at Sennheiser. "The Sennheiser AVX system — which is extremely easy to operate — is a key enabling technology, heightening the artistic experience for audience members and delivering pristine wireless audio to the Central Hub."
**Trunks and rooftops: 2000 and evolution wireless G3 Series**

Three of the limousines – one for each route – feature Sennheiser 2000 series multi-channel rack units, consisting of six channels of EM 2050 receivers and four channels of SR 2050 IEM wireless transmitters for wireless monitoring. On the three limos with the 2000 Series wireless system in the trunks, Sennheiser A 1031 U passive, omni-directional antennas are mounted to the roof of the limos to facilitate transmitting audio to and from the vehicle to performers and production staff. In Chapter 33 of the 'Red' route, Sennheiser 2000 series and G3 Series wireless equipment transmits and receives audio across three different rooftops in downtown LA, as performers interact with each other at a range of up to a quarter of a mile away.

"Los Angeles is a very challenging RF environment with a lot of DTV broadcasting and interference throughout the city," said Dave Missall, Manager Customer Development & Application Engineering at Sennheiser. "The Industry's Artistic Director, Yuval Sharon, wanted to be able to have performers interacting with audience members inside and outside each car across various parts of the city. We opted to go with the Sennheiser 2000 wireless series because the transmitter has 100 mW of output, giving us the ability to boost output power to get the coverage we needed."

"It really came down to identifying who needed to be mic'ed, and who needed to hear what, when and where," Missall continued. "We worked with The Industry's Audio Advisor Brett Jarvis, sketched out all the requirements on paper and made a detailed plan."

**The Central Hub: Choose your own narrative with guidePORT**

Once the AVX audio is received at the Central Hub, it is fed into an HDMI matrix, which routes each of the 24
A/V signals to the appropriate large screen television monitor. The audio output of each monitor is fed into the Sennheiser guidePORT system, which then broadcasts each respective audio signal to one of 24 channels. Audience members at the Central Hub are supplied with a guidePORT receiver with a keypad, on which they are able to enter the corresponding number of the monitor they would like to watch and listen to.

"Because of the circular nature of the Central Hub installation, we decided to provide audience members with the ability to key in the screen number of their choice," said Robert Genereux, Business Director System Design at Sennheiser. "The Sennheiser guidePORT system is the perfect technology for this application given its reliability and ability to handle so many simultaneous audio streams."

**The Central Hub: Find your own MOMENTUM**

Finally, each audience member at the Central Hub is outfitted with a pair of Sennheiser MOMENTUM headphones, which plugs directly into the guidePORT receiver and ensures a comfortable listening experience for the entire duration of the performance. The MOMENTUM headphones provide crisp, detailed sound for audience members, offering a fully immersive *Hopscotch* experience — no matter what channel they are tuned in to or what perspective of the production they are following.

"Both art and technology can imbue everyday life with a sense of undiscovered potential," said Yuval Sharon, Artistic Director at The Industry. "When the two work hand in hand, the awe and wonder it can inspire asks us to consider reality in a new way. It has been a tremendous adventure to work with Sennheiser to erase the boundary of inside and outside a car, and to make the whole city feel more connected than ever."

For more information on *Hopscotch*, please visit [http://hopscotchopera.com](http://hopscotchopera.com)

Discover all the exceptional artists featured in Sennheiser's MOMENTUM project on [http://www.sennheiser-momentum.com](http://www.sennheiser-momentum.com)
Captions:
1) The Industry's *Hopscotch* premieres on October 31, 2015
2) Sennheiser's AVX digital wireless microphone system discreetly captures ambient audio in (10) different limousines and sends this back to the Central Hub.
3) Three of the limousines feature Sennheiser 2000 series multi-channel rack units, consisting of six channels of EM 2050 receivers and four channels of SR 2050 IEM transmitters for wireless monitoring.
4) Sennheiser A 1031 U passive, omni-directional antennas are mounted to the roof of the limos to facilitate transmitting audio to and from the vehicle to performers and production staff.
5) Sennheiser's guidePORT system is a key component of The Central Hub, enabling audience members to listen to one of 24 live broadcast feeds.
6) Yuval Sharon, Artistic Director of The Industry, with a Sennheiser MOMENTUM Image credit: Dana Ross Photography

About Sennheiser
Audio specialist Sennheiser is one of the world's leading manufacturers of headphones, microphones and wireless transmission systems. Based in Wedemark near Hanover, Germany, Sennheiser operates its own production facilities in Germany, Ireland and the USA and is active in more than 50 countries. With 18 sales subsidiaries and long-established trading partners, the company supplies innovative products and cutting-edge audio solutions that are optimally tailored to its customers' needs. Sennheiser is a family-owned company that was founded in 1945 and which today has 2,700 employees around the world that share a passion for audio technology. Since 2013, Sennheiser has been managed by Daniel Sennheiser and Dr. Andreas Sennheiser, the third generation of the family to run the company. In 2014, the Sennheiser Group had sales totalling €635 million. [www.sennheiser.com](http://www.sennheiser.com)

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