

CASE STUDY

U17 Submarine, Technik Museum

SINSHEIM, GERMANY

Genelec transforms U17 submarine
into an immersive visitor experience



GENELEC®



A LANDMARK EXHIBIT

For transport technology enthusiasts, Germany's [Technik Museum](#) is a must-visit destination, housing one of Europe's most significant collections of transport artefacts. Across two locations, the historic towns of Sinsheim and Speyer in south-western Germany, the museum features over 6,500 exhibits that explore military history, aviation, space travel, and marine mechanics. Following its anticipated arrival last year, the [U17](#) submarine has become a highlight attraction at the Sinsheim museum, offering far more than a static exhibition piece. It invites visitors to dive into a multisensory journey that explores life onboard the vessel, as [Genelec](#) loudspeakers recreate the sounds of daily operations for a new generation of passengers.



HISTORIC TECHNOLOGY REIMAGINED

As the first German submarine to venture into American waters after World War II, the U17 is a highly regarded addition to the Sinsheim collection. "The elaborate transport of the submarine across Germany generated

significant public attention even before opening at the museum and underscored the significance of the new exhibition,” says Jan Lipp, Audio Engineer and Project Manager at [Laboratorium Audioproduktionen e.K.](#)

For several years Laboratorium Audioproduktionen has been creating multimedia audio projects, sound designs, and immersive audio installations for museums and exhibitions. To support Technik Museum Sinsheim, the team – led by Managing Director Marc Simon, Audio Engineer and Project Manager Jan Lipp, and Sound Designer Ksenia Cherkashina – set out to transform the U17 exhibit into an emotionally engaging, immersive experience through a custom-designed acoustic concept.

“The goal was to transform the U17 into an emotionally engaging experiential space, with clear dramaturgical structure, atmospheric depth, and a high degree of authenticity,” mentions Marc Simon. “In other words, upon entering, visitors can “dive in” and experience the submarine as a living, interactive vessel.”

Full of narrow passageways and technology built for underwater use, the submarine presented a uniquely challenging environment to install an immersive AV system. “Metallic surfaces, narrow corridors, and many small compartments have specific acoustic characteristics,” Lipp explains. “In order to integrate an impactful sound system, it required precise planning of loudspeaker positioning, discreet design, and a way to combat the complexities of technically sensitive spaces.”

AUDIO BELOW DECK

With the aim of creating emotional interactions between Technik Museum visitors and the historic technology that shaped life on the U17 submarine, Genelec loudspeakers were chosen to deliver the exhibition’s immersive soundscape. “We were committed to choosing Genelec

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Jan Lipp, Audio Engineer & Project Manager, Laboratorium Audioproduktionen e.K.



loudspeakers from the outset because they match the installation's requirements perfectly, both in terms of design and technology," reveals Lipp. "A decisive factor that led to their selection was the robust, yet timelessly elegant form factor. They blend unobtrusively into the existing technical environment of the submarine, which was essential to the exhibit's emotional impact. When loudspeakers are not consciously perceived, visitors are convinced that sound is emanating directly from the space itself."

A total of thirteen Genelec loudspeakers were supplied by [Musikhaus Schlaile GmbH](#), all dark grey to correspond with the interior mechanics. "We installed eleven compact [8010A](#) studio monitors throughout the submarine," says Lipp. "For such small loudspeakers, they deliver a surprisingly precise and balanced sound image that made them ideal for the cramped structures and limited space inside the submarine. Two larger [8030C](#) models offer necessary power reserve and dynamics to ensure powerful and distortion-free sound even at peak levels."

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As visitors explore the submarine, the hum of engines, metallic sounds of controls, sonar pings, and the oppressive sense of being underwater become increasingly apparent. With loudspeakers hidden discreetly in plain sight, the detailed soundscape adds an eerie atmosphere, while in some spaces, interactive sequences are triggered to heighten the experience. In the engine room, a motion sensor detects when somebody walks in, triggering the sound of the diesel engine. “Through this targeted use of audio elements and various sound configurations, a precise spatial listening experience is created that ensures each sound is heard at the right place and the right time.”

A highlight of the exhibit is the alarm sequence, during which the submarine transitions from alert status through to stealth mode and combat. “This is supported by immersive sound design, specifically produced voice recordings, and newly developed Foley elements,” describes Ksenia Cherkashina. “As a source of inspiration, we received original audio tracks from the series *Das Boot*, which we reinterpreted and reproduced for the specific acoustic conditions in the U17. When paired with lighting changes and the submarine’s original red emergency light, it creates a particularly intense, emotional moment.”

When it came to bringing the various audio and lighting elements together into a single immersive environment, the system required precise coordination and reliable control. In addition to the Genelec loudspeakers, three Adam Audio subwoofers and three Infrasonic subwoofers were installed to extend low-frequency impact for a physical and atmospheric listening experience. A Mac mini running QLab handles media playback and control, while a system of OSC triggers and sensors was developed to respond to visitor movement and time-controlled sequences, allowing soundscapes to shift seamlessly between calm background ambience and more exciting moments.





A LASTING IMPRESSION

“The overarching goal of the U17 exhibit was to create a spectacular attraction for all the senses,” adds Lipp. “We wanted the visitors’ experience to go beyond mere knowledge transfer, showing how museums can not only inform, but also leave a lasting impression.”

For an exhibition where technology plays such a central role, the Genelec system integrates seamlessly into the environment while enhancing the emotional impact of the experience through sound. The result has proven to resonate with many of its visitors, with some even describing the sensation of being onboard a moving and operational submarine.

“Sound design for a walk-through submarine is not an everyday scenario and required a high degree of creative flexibility and technical expertise, but this uniqueness was ultimately part of the project’s appeal,” Simon confesses. “We were very satisfied with the Genelec loudspeakers. In our own surround studio, we work with Genelec 8030

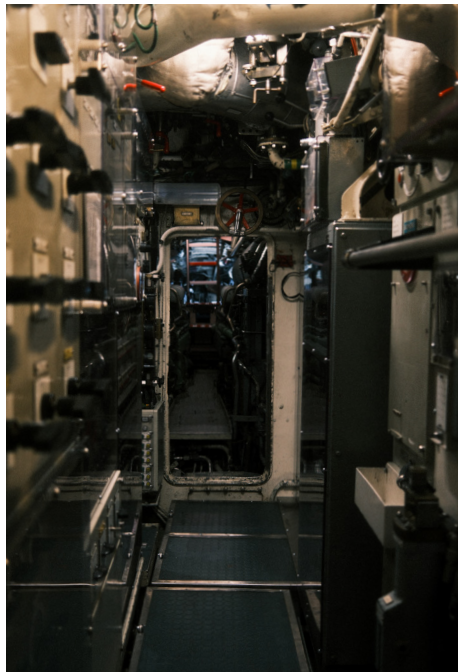
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Director, Laboratorium
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systems and are constantly impressed with their quality, precision, and flexibility – the same proved to be true in this installation.

“We are hugely grateful for the support of the museum’s technicians and electricians, as well as Patrick Lesser from Musikhaus Schlaile GmbH who supplied the Genelec loudspeakers that helped bring the U17 back to life,” concludes Lipp. The Laboratorium Audioproduktionen team are now working on another installation at Technik Museum Speyer, where Genelec loudspeakers will once again play a vital role in shaping highly immersive visitor experiences.



THE DETAILS

Client

Technik Museum Sinsheim

Audio Design

Laboratorium

Audioproduktionen e.K.

Integrator

Laboratorium

Audioproduktionen e.K.

Genelec Distributor

Musikhaus Schlaile GmbH

Loudspeakers

- 11 x 8010AP
- 2 x 8030CP
- 3 x Adam Audio
TS10 Subs
- 3 x Infrasonic Subs

Control

QLab

OSC Trigger System

Raspberry Pi

Audio

Arturia AudioFuse 16Rig

ADAT D/A Converters

Media

Apple Mac mini M4