

## the sheer pleasure of sound

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The Kinetic  
Sculpture by  
ART+COM in the  
Inspiration room  
consists of 714  
suspended metal  
balls.

## The sheer pleasure of sound

### Acousmatic sound installations for the new BMW Museum

*Design has become one of the most important components in the conception and construction of a museum. Leaving nothing to chance, museums now create holistic spaces where architecture, lighting design and media are combined to present content and information in a more effective way. It is therefore surprising how often museums neglect to plan a well-thought-out sound installation. Sound media are typically only used as a fallback for information that is difficult to communicate visually or as an accompanying medium that highlights an effect primarily created using other media. However, a sound installation orchestrated to fit the space and tailored to the exhibition's key message can be used to enhance and invigorate the visitors' entire museum experience.*

#### Audio design in museums

In failing to incorporate audio design into their planning, museums are missing out on a key way of drawing in visitors. A museum's principle aim is, ultimately, to move its visitors, and appealing to them using sound, rather than merely images, is the most effective way to achieve this.

Hollywood made this discovery a long time ago; film soundtracks are now always meticulously planned and every conceivable sound or noise is recorded again and added in later by sound designers. A great deal of thought also goes into creating film music, which is often recorded by world-class orchestras. In making the invisible visible, music is able to speak strongly to people's emotions and feelings, striking a chord in their very soul. We process this information using our sense of hearing. Birdsong, for example, can be manipulated to sound either charming or threatening. Appealing to cinema-goers through their ears simply means creating tension or "suspense" as Alfred Hitchcock used to say; his film *The Birds* is an excellent example of this.

We believe that in museums, too, audio design should be planned down to the last note. Audio design opens an additional dimension of experience for the visitor and is therefore especially suited to communicating content and information in a way that leaves a lasting impression.

#### The new BMW Museum

At the BMW Museum in Munich, the audio design was planned as a central design component from a very early stage. With this museum, BMW has been able to create an extra-special connection between media, architecture and exhibition design (See also "Museum in Motion"). ART+COM, a Berlin-based new media design studio, was responsible for the spatial media design and interactive installations, and the Stuttgart-based studio ATELIER BRÜCKNER took charge of the architecture and exhibition design. Even before production began, it was clear to

all that sound design tailored to the project's requirements would form an essential part of the museum's media-centred concept.

As the partner responsible for overseeing all of the museum's media installations, ART+COM set up and managed an international competition for the planning of the entire audio design concept. Only four companies made it to the final selection and, in the end, it was our compelling concept that the judges opted for. Our team of five audio experts then worked for around two years to create the audio design for the BMW Museum.

#### The requirements

The main requirement for the new BMW Museum was that its architecture be suitable for exhibiting more than just cars; the construction was to represent a homogenous piece of art comprising architecture, media and exhibits, in combination with a complementary soundscape of music and tones.

The main requirements were:

- The soundscape should have a positive effect on the museum's visitors and create a pleasant atmosphere.
- The different sounds in the different rooms should be in tune with one another in order to create a composition of sound.
- The music and sounds should not force themselves on the visitors; instead they should appeal to them on an emotional level.
- Music and sounds should be included in the conception of the rooms, and designers should explore how they would interplay with and enhance the architecture and the other media used.

#### Creating the sounds:

We composed a suitable sound installation for each room. Sound installations are pieces of music composed in such a way as to place emphasis on the images evoked by particular sounds. Time has no role in the design of these pieces; it is tonality and the creation of an atmosphere that are important here. Sound installations only unfold their full effect in the specific room they have been designed for. For example, we use a particular frequency spectrum that harmonises especially well in a certain room, or we use the geometry of the room to create reflections and resonances. In other words, the room is the instrument we play on.

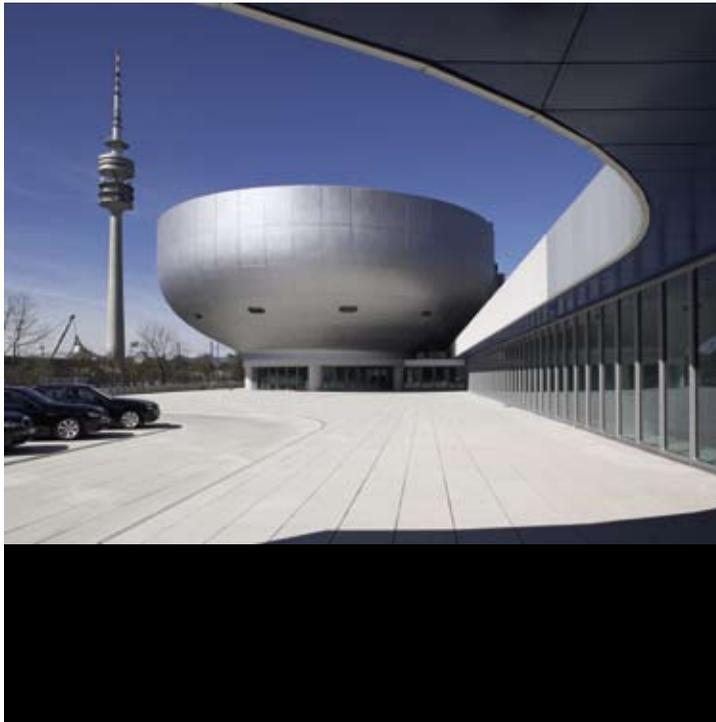
It was also important to create sounds that were appropriate to the BMW brand and values, as well as to the spatial media design and the architecture. We aimed to create a minimalistic yet high-quality soundscape. All the sounds were created using only two instruments: a cello and a Steinway Concert Grand - Model D. A huge range of different sounds can be produced by these two instruments. However, much more crucial was the selection of the musicians. A classical virtuoso is not

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Over 300  
loudspeakers have  
been invisibly  
installed in *BMW  
Square*, the heart  
of the BMW  
Museum.



Exterior of the  
BMW Museum  
with *the Museum  
Bowl* designed by  
Karl Schwanzer.



necessarily a master when it comes to teasing the more outlandish sounds from a piano. Even more difficult is finding a cellist who has a good enough ear to explore unusual sounds, such as a whale song. To meet this challenge, we had Canadian cellist Kirk Starkey flown over to play with Swiss cellist Stefan Baumann; together they created the sounds we needed.

The next stage was to process the sounds live electronically. This enabled us to obtain additional sounds without losing the original character of the instruments. This was extremely important as we chose these two instruments precisely because we felt they communicated BMW's core values very effectively.

### Shaping the space – the acousmonium

Creating music to harmonise perfectly with the different environments and complement the media installations optimally was one challenge we faced. Another, even tougher one was incorporating the spatial element into the composition. The

idea of relating music to space is one that has been much discussed, but it has rarely been realised in a truly compelling fashion.

The audio design at the BMW Museum is based on something called an acousmonium, an orchestra of various loudspeakers. Acousmoniums are a familiar device in New Music; composers who wanted to play tape recordings of their music grew dissatisfied with having to make do with two loudspeakers while those who composed for orchestras could draw on the rich sound produced by over a hundred musicians. The French composer François Bayle is thought to have been the first to devise an acousmonium for his music, placing numerous loudspeakers on the stage and concert space rather than simply the usual two. Just as the musicians in an orchestra play instruments of different designs, Bayle employed loudspeakers of different sizes and shapes, routing his composition from the mixing console to the assembled speakers.

An acousmonium can be used to orchestrate entire spaces. We envisioned going beyond creating sounds that would emanate arbitrarily from nowhere in particular – our concept aimed to compose the *space* for the sounds. Actually, one can compare this kind of composing to arranging an orchestra. Whereas older classical music (Mozart, for example) sounds great when performed by an orchestra, it is always possible to play it on the piano too; the composition remains the same. This works because orchestration was not widely used to express specific artistic intentions in those days. A hundred years later, it's a different matter altogether. Mahler, for instance, made conscious use of the layers of sound provided by an orchestra and thus his compositions can no longer be reduced to the piano because the layering of the sound is an integral part of the composition. To provide another example: An orchestra can hold the audience's interest for several minutes with a single note by varying the quality of the sound. But if that same note is played by only one instrument, in a matter of seconds it will become boring – monotonous in the literal sense of the word.

Taking this principle a step further, we actually orchestrate three-dimensional space. What makes our work so unusual is that it relates to space in a very specific way. The same music played by an orchestra (or over two loudspeakers) would not have the same intense effect. We believe that spatial orchestration is particularly essential when designing music for a museum because it allows other compositional elements such as melodies and chords to be used with much greater restraint – which is crucial if we are to appeal to audiences on an emotional level without distracting their attention from the exhibition itself. Using sound quality and spatiality for specific effect makes it possible to compose music that adds depth to the museum experience without ever becoming obtrusive.

### The AROS III© Sound System

For the tonal and spatial orchestration of the various areas of the new BMW Museum, we devised an entirely new sound system. Called the AROS III© – AROS stands for acousmatic room orchestration system – the system is based on an acousmonium incorporating over 200 channels and 600 loudspeakers.

An acousmonium, in particular the AROSIII© System, is completely different from other sound systems such as surround sound (5.1 or 7.1) or wave field synthesis<sup>1</sup> because it generates rather than simulates space. Thus, in the 5.1 systems frequently used in cinemas, there is no real near and far. If something is supposed to sound far away, the impression of distance has to be simulated by adding artificial reflections and reverberations. In other words, the ear must be fooled. However, this only works up to a certain point; the human brain is not so easily tricked. With an acousmonium, on the other hand, if something sounds more distant, the loudspeaker really is further away. Conversely, to achieve the effect of a sound emanating from nearby, the loudspeaker is placed closer to the listener. The principle may sound simple to the point of being banal, but actually hearing and experiencing three-dimensionality cannot be compared to anything else. Even more interesting is the use of nearby and distant loudspeakers to create entire worlds of sound. It is possible to have these move through the room, by assigning a carpet of sound to four particular loudspeakers and then transferring (morphing) them onto four loudspeakers further away, and so on.

Our AROS III© sound system is an expanded acousmonium that is computer controlled. It features certain loudspeaker arrangements that we standardised to create particularly interesting spatial orchestrations. This standardisation also allows us to test and present compositions in our studios using a smaller acousmonium (AROS II©). Most of the loudspeakers for the AROS II and III systems were designed and built to our specifications by Strauss Elektroakustik.

Of course, if the spatial dimension is to be integral to the composition, it follows logically that the final stages of work have to be completed in the actual room of the museum where it will be heard. Loudspeakers are to space what strings are to a piano – neither can work alone, but together they form an instrument that produces sound.

### Three examples from the museum

#### BMW Square

The core of the museum is called BMW Square. Sophisticated LED technology is used to illuminate the façades of the seven exhibition houses grouped around this large, central area with both abstract and figurative motifs. The Square serves as an entry point to the exhibition houses, and visitors cross it from different directions and at different levels by means of a ramp system. We worked closely with the

media designers and architects to devise a sound design that would enhance the visual impact of BMW Square. The aim was to create an area that would be perceived as both spacious and friendly. We wanted the soundscape to be appealing and distinctive without being obtrusive and to convey a positive mood. The result of our efforts is a reduced composition that consists of musical “fragments”, short sequences that begin only to stop again almost immediately. In a sense, they are like musical preludes or teasers – they give visitors just enough to whet their appetites and make them want to explore the rest of the museum. Because the soundscape in this key space is so reduced, a large acousmonium was all the more important. Much of the composition’s appeal lies in its distinctive three-dimensional quality and in the combination with the patterns of illumination on the glass façades. The acousmonium integrated into BMW Square consists of more than 300 loudspeakers, all of which are concealed in columns, walls, the floor and the ceiling.

#### The Inspiration room

The “House of Design“ is the first exhibition house visitors enter on their tour of the museum. The Kinetic Sculpture in the first room represents the starting point for any creative process – inspiration – and metaphorically translates the concept into spatial terms. The visual impact of the message conveyed by the sculpture by ART+COM (see “Museum in Motion“) is reinforced by a constantly changing soundscape. It consists of a specially composed sequence of chords played on a piano and then electronically manipulated, along with brief musical fragments played on a prepared piano and the sound of a voice that wanders somewhat through the room. Use of a large acousmonium was not necessary here, since the central elements were the sequence of chords and sounds. 20 loudspeakers were enough.

#### The Visual Symphony

At the end of the tour of the BMW Museum, visitors are in for a special treat: the “Visual Symphony“, a 360-degree panoramic projection created by the Berlin-based film director Mark Tamschick. Visitors are led into the old part of the museum known as “the Museum Bowl“, traversing several suspended platforms until they reach the largest and uppermost platform, which affords an unobstructed view of the gigantic projection surface. Most of the time, all they see initially are a few spare, fragmentary images, but a subtle, highly spatial soundscape invites them to linger. A beautiful, evocative film sequence is shown in intervals of approximate-

<sup>1</sup> Wave field synthesis is a spatial audio rendering procedure that aims to create virtual acoustic environments. The system produces artificial (sound) wave fronts that seem to originate from a virtual starting point.

ly 20 minutes, set to rousing, almost orchestral music. We say “almost orchestral” because we didn’t want to go for the obvious solution of underscoring the grand finale with a big orchestra number in the manner of Hollywood melodrama. That made creating an acoustic climax in keeping with the overall concept of the museum all the more challenging. We came up with a truly impressive experience of space and sound: a symphony that starts out with subtle sounds and develops into a dreamy, appealing cello melody that segues into a powerful final harmony. The piece is orchestral in the sense that is played on an acousmonium incorporating more than 125 loudspeakers and 64 channels. Many of them are suspended below the ceiling, but we also concealed some of the tweeters in the handrails of the stairs. The film and the composition complement each other to produce a truly unique audio-visual experience – a fitting culmination of the museum tour.

#### Conclusion:

*The way we understand it, outstanding audio design means forging sound, music and art into an integral whole. We incorporate three-dimensional space and the specific architecture into our compositions to create unique tapestries of sound and customised audio concepts that appeal on an emotional level – at times intense, at times subtle, but always stirring in some way. This kind of audio design allows museums and exhibitions to take the experience they offer audiences to an entirely new level and thus itself might be considered a new art form, one that we strive to master.*

**Ramon De Marco and Daniel Dettwiler, audio designers at Idee und Klang, Basel**



The larger part of the loudspeakers making up the acousmonium are integrated into the ceiling of the Bowl.

The 360-degree projection of the “Visual Symphony” constitutes a worthy conclusion to the museum tour.

### **Idee und Klang - Audio Design Studio, Basel**

Distinguished Swiss audio design studio Idee und Klang creates high-end sound installations for museums, art galleries, show-rooms and events – taking care of everything from the concept to the composition to the production. The company specialises in using acousmoniums to create spatial orchestrations that not only convey information and elicit various moods, but provide audiences with an integrated three-dimensional experience.

Idee und Klang GmbH is managed by the sound artists Ramon De Marco and Daniel Dettwiler, who founded the company in 2002. Working with an extensive network of sound designers and composers, they have realised a wide variety of international projects. These frequently include the participation of first-rate musicians, who ensure the musical elements are formed from authentic, organic sounds.

A unique sound studio at the company's headquarters in Basel allows De Marco and Dettwiler to realise their ambitious aims and exacting quality standards. It not only includes a collection of microphones that is unparalleled in Europe but also an entire orchestra of loudspeakers that the artists use to design and compose their acousmatic sound installations.

In addition to sound installations, Idee und Klang also provides film music and sound design for films, acoustic branding for companies, music for theatre productions, radio and advertising, and produces CDs for innovative musicians. When companies seek audio concepts that stand out, they turn to the artists at Idee und Klang, who have realised projects for Louis Vuitton, Benetton, Diesel, Swatch, Schweizer Fernsehen, Kunstmuseum Basel, the Pompidou Centre, ExperimentaDesign in Lisbon and musicians and directors such as Heiner Goebbels, Herbert Grönemeyer, Thomas D and Christian Zehnder.

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