Museum of Magnetic Sound Recording

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EXHIBIT DESIGN

Museum Types

Object Centered

Object centered museums concentrate on the collection's objects, often with an individual focus. It's a treasure based approach that has unique pieces. Object centered museums are often art museums with two dimensional pieces to be viewed separately with little distracting context. The goal is for the space to be contemplative and focused on the objects aesthetics.

Parrish Art Museum
New York City, New York

Narrative

Narrative museums tell stories of people and events, often specified to the geographic location or a specific time period. The objects displayed are within the story itself and aid in educating the visitor. The pieces serve as evidence for the story and displays are often designed to mimic the narrative's environment. These museums often use many types of media and can convey emotions through script and reenacted dramas.

Southern Ute Cultural Center
Ignacio, Colorado

Client Centered

The intention of client centered museums is to be interactive for the audience. The ideal visitor experiences the museum individually or in a small group, learning more about topics that interest them. Children's and science museums are often client centered to impart knowledge on the visitor without extensive literature. There are several common types of role playing and immersive exhibitions for the built environment to simulate an experience.

Grammy Museum
Los Angeles, California

Community Focused

Community focused museums are often specific to the local history or a specific collection of works native to the area. These museums pilot programs like language training, health education, children's workshops and motivate community healing and well being. These museums tend to be under funded, but display quality work alongside making a tangible difference around them.

Spartanburg
Spartanburg, South Carolina

National Museum

National museums are large scale, high occupancy constructions that are tourist attractions for millions every year. These museums have extensive collections and archives and keep a nation's most prized and valuable works. These museums often implement narrative and interactive schemes within their displays. These museums are national landmarks and are promoted tirelessly.

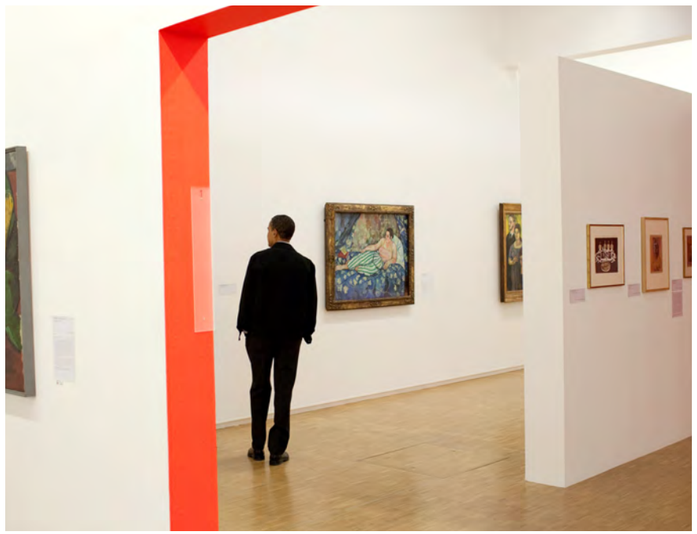
Smithsonian Air & Space
Washington D.C

EXHIBIT DESIGN

Exhibit Layout

Space Enhances Objects

This exhibit design maximizes the impact of the objects and increases the probability that the objects will be seen. This structure capitalizes on the architecture and arranges the collection to maximize viewing. This arrangement organizes key displays in the circulation paths with the most traffic.



Centre Pompidou
Paris, France

Objects Create Space

This exhibit design emphasizes and arranges the space with the objects themselves. The objects are integrated into their immediate setting to navigate the circulation. The themes are non correspondence and their non relation to the architecture, and encourages exploration in the space.

Castelvecchio
Verona, Italy

Objects/ Space Remain Autonomous

This exhibit layout is independent from the architecture; both remain separate in nature. The space has no critical role in organizing the collection and the spatial arrangement is independent. The space is passive and the objects exist on their own. The architecture is secondary to the objects in some places, and vice versa.

Tate Modern
London, England

Exhibit Layout Diagrams

These diagrams sketch the general layout of prominent museums. It shows the difference between layout and adjacencies and almost resembles a bubble diagram, with the dark circles and lines as the more prominent locations.

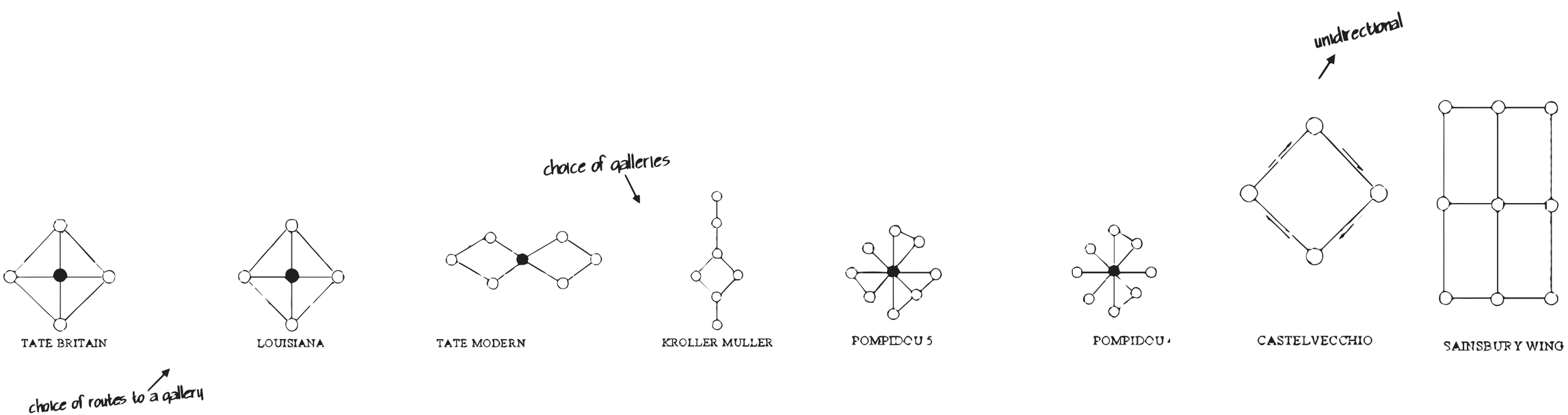


EXHIBIT DESIGN

Display Types

Wall Mounted

Wall mounting is ideal for two dimensional art like painting and prints. This allows the viewer a direct and focused view and focuses the viewer's eye with focal lighting. This is the most typical display system for art museums.

Northern Arizona University
Flagstaff, Arizona

Case

Case display is ideal for small collections that need to be organized together. This system provide protection from the viewer and allow for lighting and climate control if the piece requires it. It also provides security to more valuable pieces.

Oriental Institute Museum
Chicago, Illinois

Pedestal

Pedestal display is ideal for sculptures and statues because it allows views from all sides and visibly lifts the eye line. This symbolically elevates the pieces from the rest of the collection and the surrounding architecture. Contrasting lighting is also key to pedestal display, providing drama.

Hessel Museum of Art
New York City, New York

Suspended

Suspended display is ideal for free form and large objects and can be used to axonometrially show construction of objects or objects sequentially. This, like pedestals, raises the viewers eye line to symbolically elevate the piece. It can also be used to create an immersive interior.

Mercedes Benz World
Surrey, England

Recessed

Recessed display must be incorporated into new construction and is ideal for grouping objects that will form a narrative. These create individual moments for more permanent collections and need specific climate and light conditions.

Capital Museum
Beijing, China

Cross-Referencing is the arrangement of exhibited objects in a way that mediates additional relationships between works, multiplying affinities and cross-references images across several spaces.

PRECEDENTS

Program

Museum of Musical Instruments

Location: Phoenix, Arizona

Designer: RSP Architects

Program:

Offices
Main Corridor
Library
Reception
Store/ Cafe
Auditorium
Archives
Supervised Object Study
Galleries
New Exhibition Spaces

1st FLOOR

Program

Reeves Studio

Location:
Evanston, Illinois

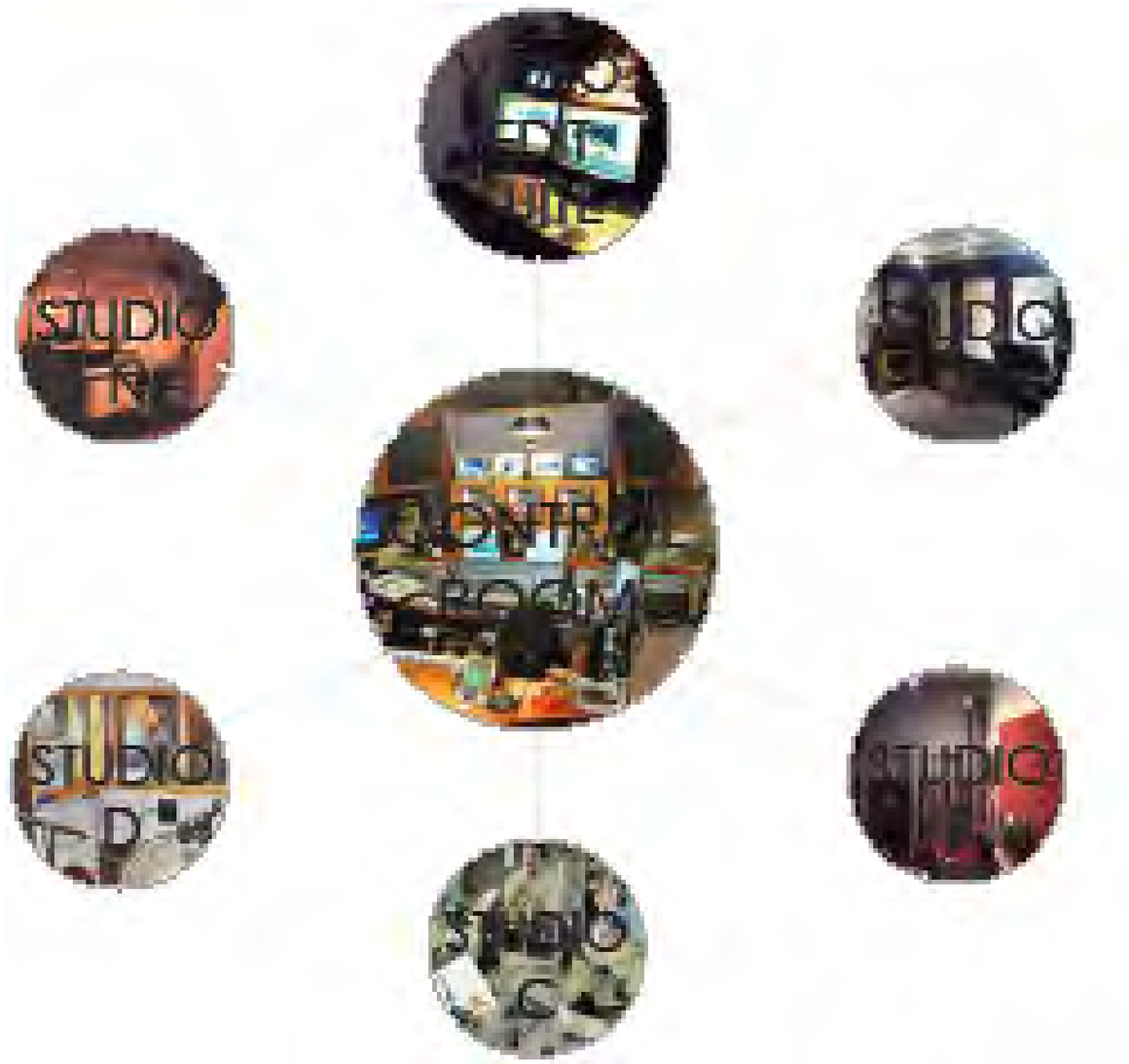
Designer: Jim Reeves

Program:

Control Room

Video Edit Room

Studios Accomodating
Differing Sounds



D i s p l a y

Porsche Museum

Location:
Stuttgart, Germany

Designer: Delugan Meissl

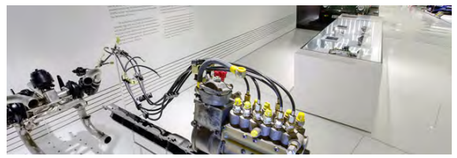
PROLOGUE
The different milestones in the life of Ferdinand Porsche.

LIGHT
The core competence of Porsche lightweight construction.

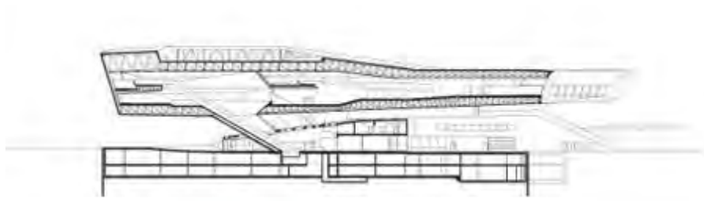
CLEVER
Porsche seeks to respond to technological challenges with the best, rather than quickest solution.

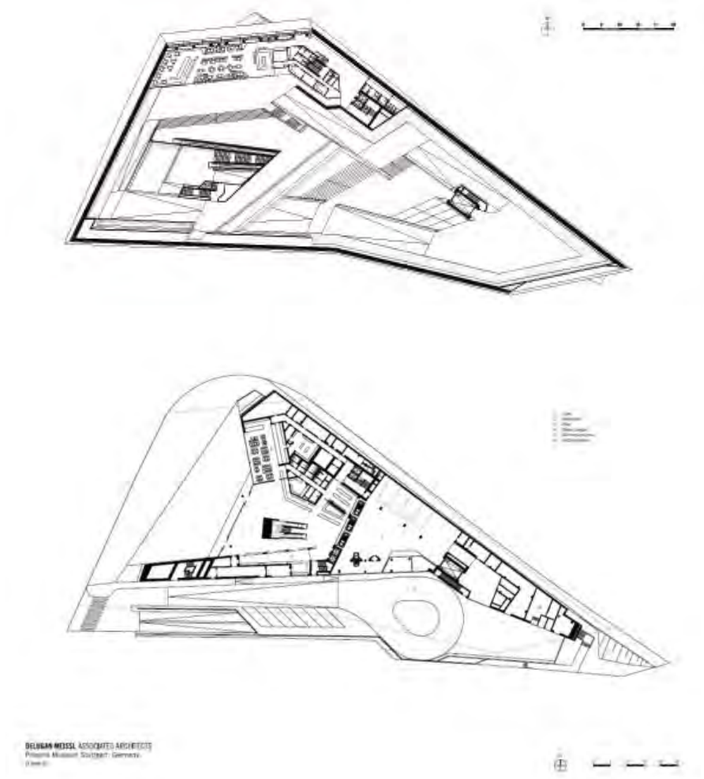
FAST
Porsche's aerodynamics and vehicle control.

POWERFUL
Focuses on Porsche's high performance engines and their design.



CONSISTENT
Defines the stylistic traits of a porsche throughout the years.





D i s p l a y

The Costume Institute

Location:
The Metropolitan Museum of Art, New York City

Designer: Anna Wintour

Continuous digital backdrop that highlights a revolutionary textile of the time period or decade that evolves throughout the exhibit.

Display

Spectacle: The Music Video

Location:
EMP Museum
Seattle, Washington

Designer:
Jonathon Wells

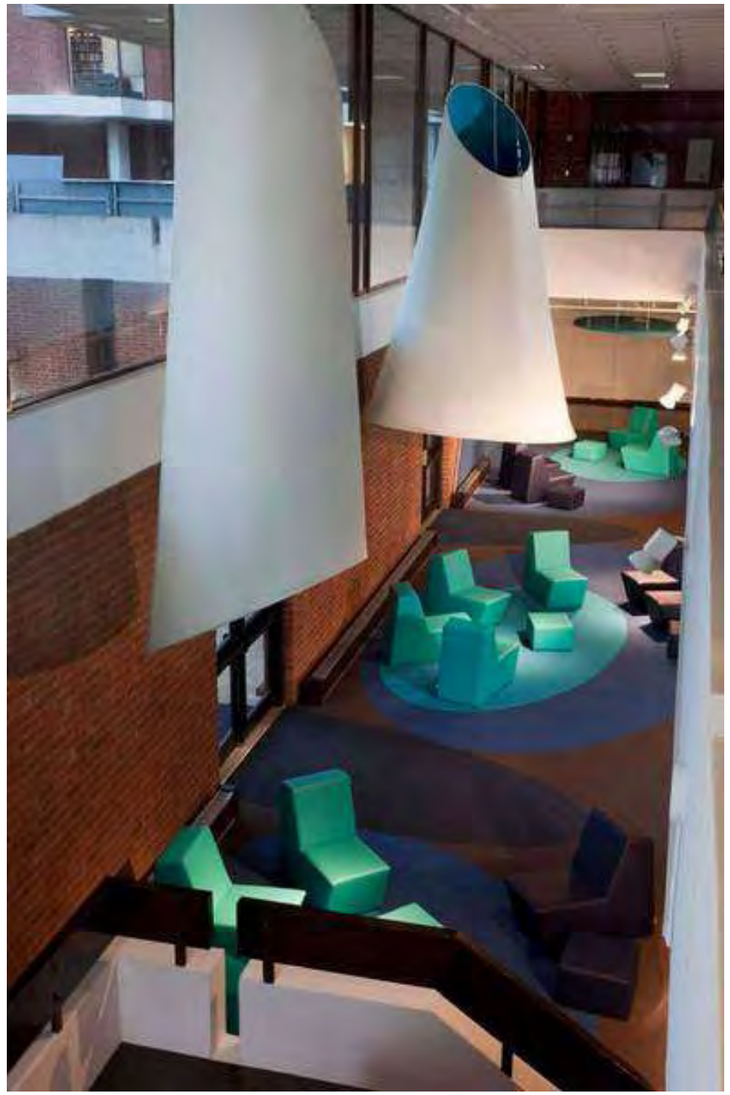
Through the use of legendary props, interactive experiences, and more than 300 videos, Spectacle: The Music Video traces the evolution of the genre and cements its place at the forefront of creative technology. Over 35 years of musical culture is displayed throughout the exhibition. In conjunction with the exhibition, the Museum will present a range of related public programs, including screen

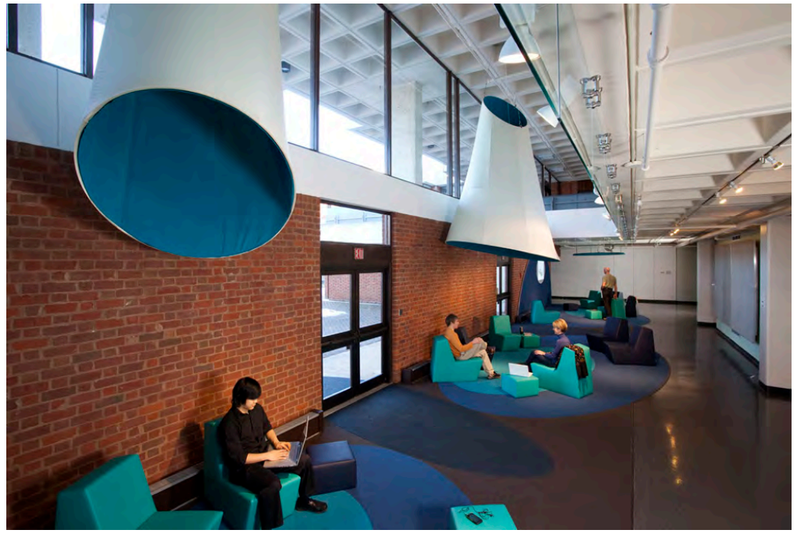
UVA Sound Lounge

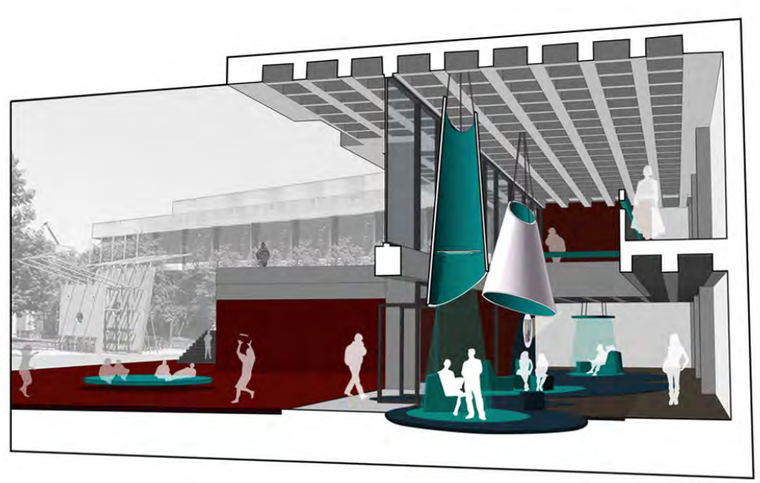
Location:
University of Virginia
Charlottesville, Virginia

Designer: Joel Sanders

Holosonic speakers, installed within three sonic cones, project columns of directed sound audible only to people within the zone defined by three blue ellipses inscribed within the carpet beneath them.







The Grammy Museum

Location:
Los Angeles, California

Designer:
Gallagher & Associates

The large and colorful Crossroads table spreads out before you, inviting you to explore nearly one-hundred and sixty genres of music. Grab the ones that interest you; they open up to reveal photos, songs, and stories that describe the music and its impact. In turn, each genre reveals connections to others, inviting you to experience familiar sounds in new ways, and new sounds in exciting ways.

Museum of Making Music

Location:
Carlsbad, California

The museum's galleries consist of more than 450 vintage instruments and artifacts on display, hundreds of audio samples of popular music and an area for visitors to interact with a variety of live, hands-on instruments.

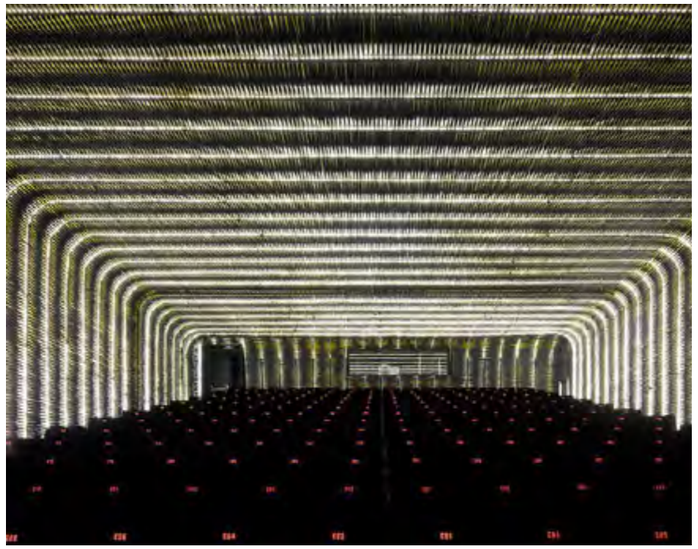
S t o r a g e

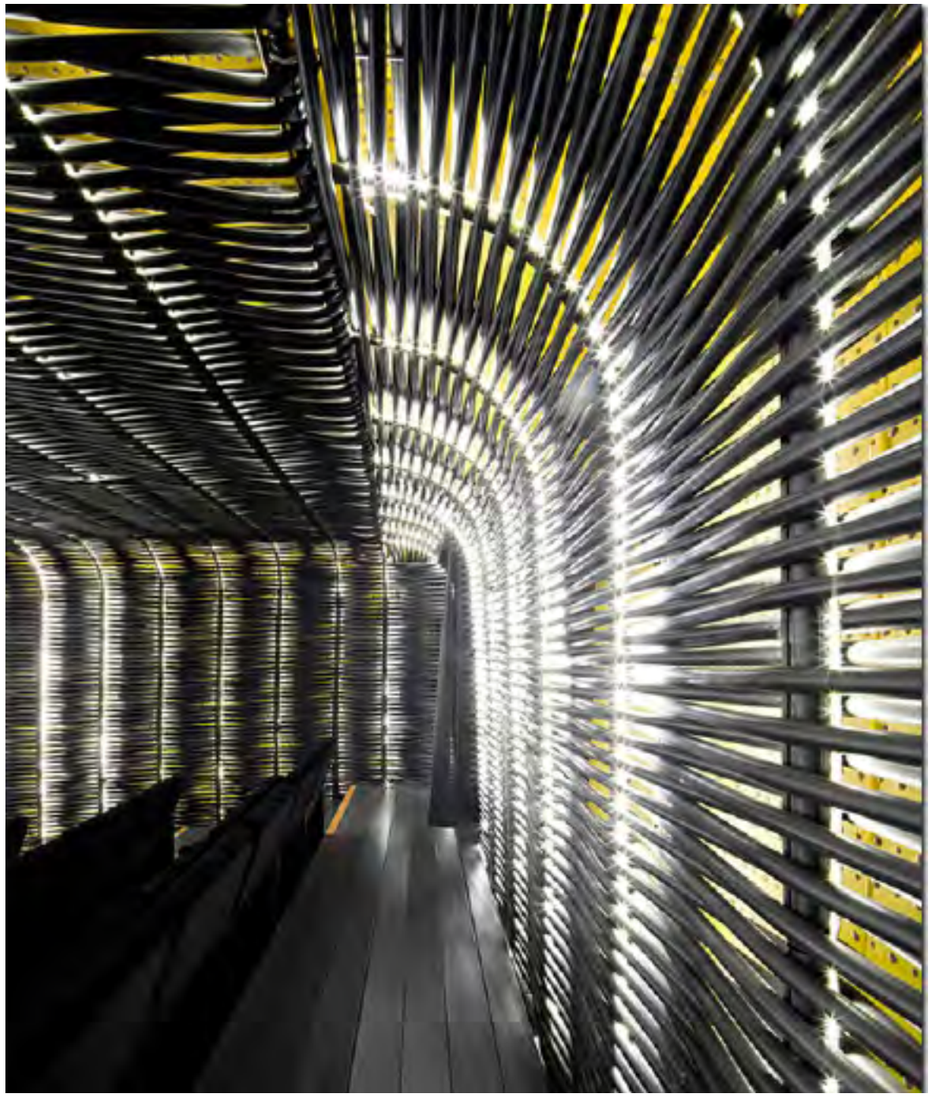
The Costume Institute

Location:
Cinema Center in Matadero de Legazpi, Madrid

Designer:
Churtichaga+ Quadra-Salcedo

Refurbishment and conversion of an old slaughterhouse into a public cinema center housing a film archive, film and television studio, two cinemas, offices, canteen, and summer film patio.





S t o r a g e

Herbology Center Storage

Location:
Natural History Museum,
London

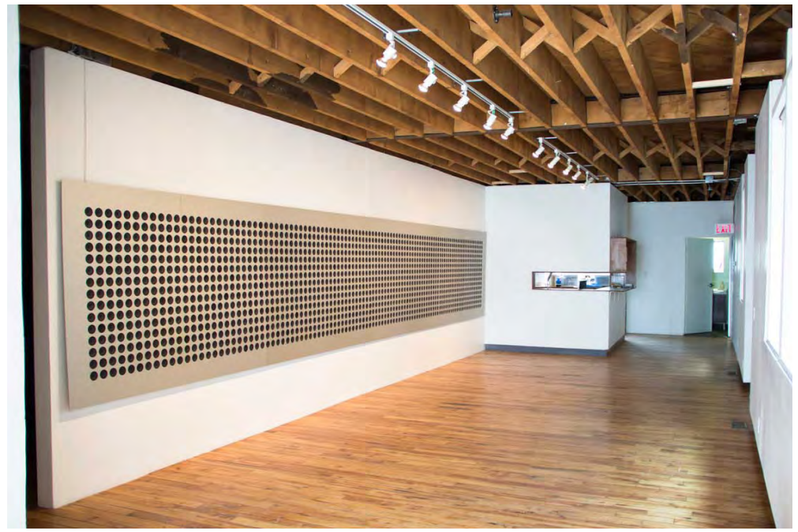
Sound

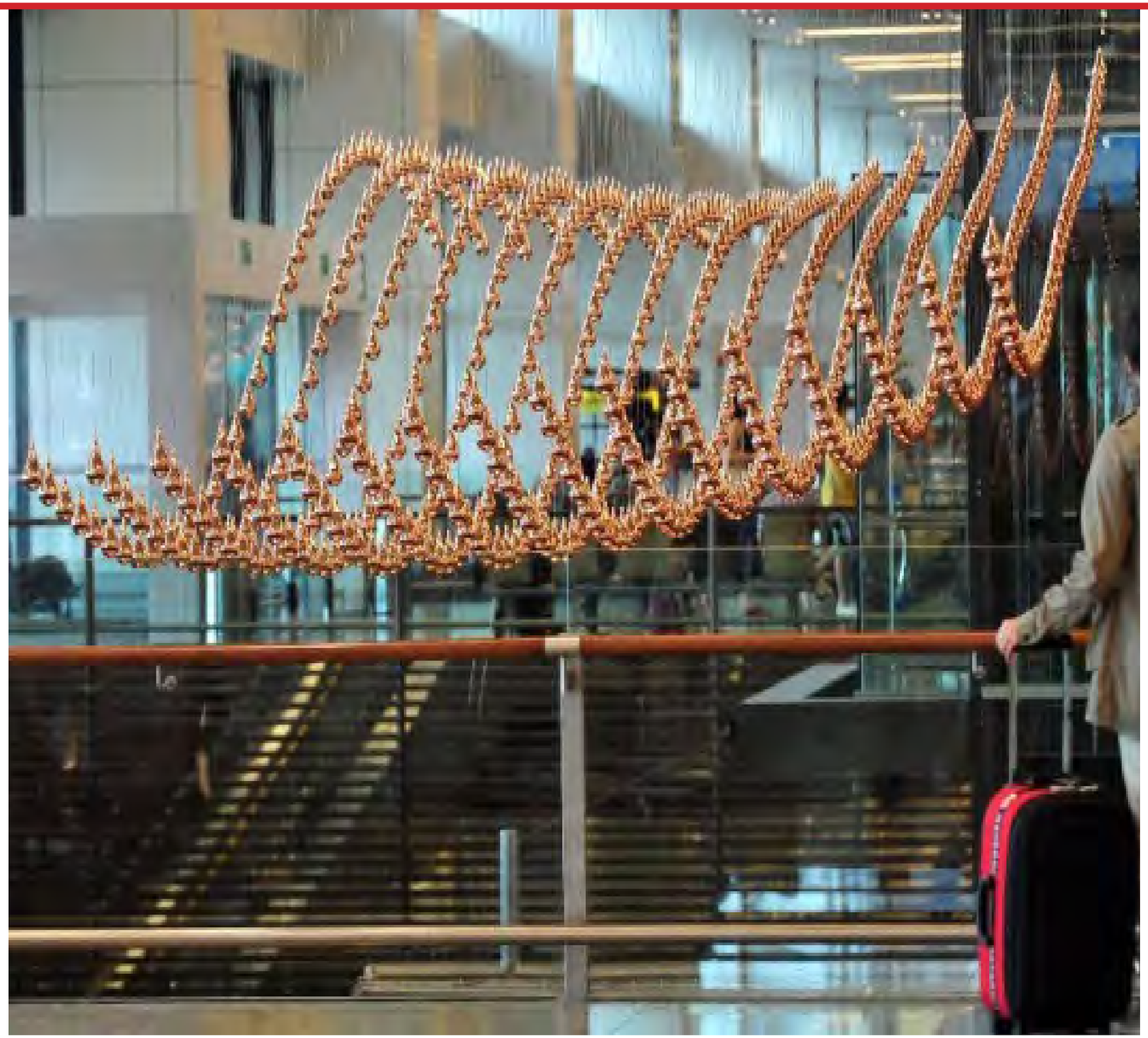
Microtonal Wall of Sound

Location:
Museum of Modern Art
New York City, New York

Designer: Tristan Perich

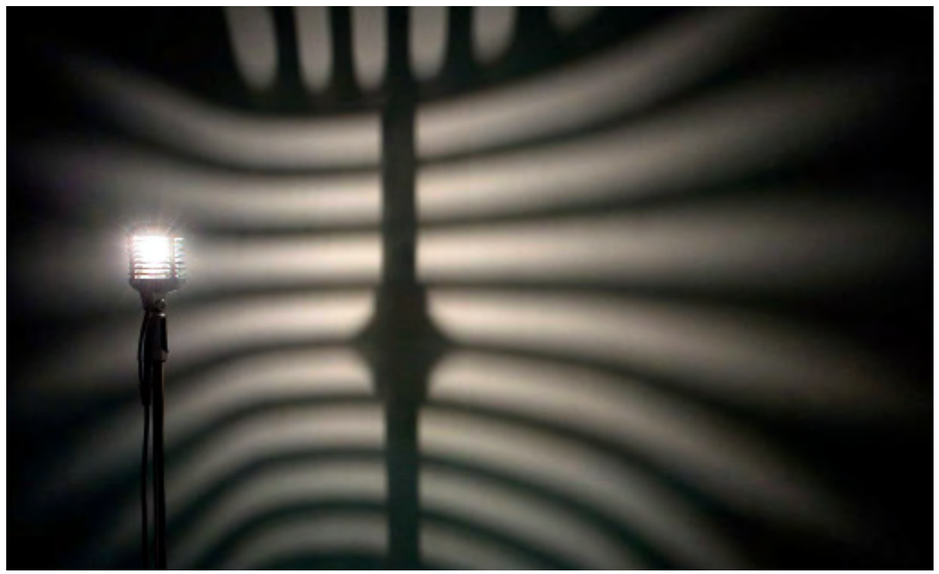
Microtonal Wall is made up of 1,500 very simple one-bit speakers, tuned individually to create an intricately varied continuum of pitch,
rendering this twenty-five-foot wall a spectrum of sound.





Kinetic Rain
Singapore Changi Airport, July 2012, Art+Com
It's the world's largest kinetic sculpture. It is comprised of 608 copper-plated aluminum raindrops. Each rain drop is attached to computer-controlled motors that determine the movement of each raindrop.

Richard Garet's *30 Cycles of Flux*
MoMa 2013 Soundings: A Contemporary Score
Silent sound installation. Room full of speakers omitting low frequencies with strings attached. The viewer is able to see the vibrations of the sound



Camille Norment's *Triplight 2008*
MoMA, 2013, Soundings: A Contemporary Score
Microphone cage. Innovative Object Display.
Displaying an antiquated object in a modern or repurposed way.

Acoustics

Exhibit Design

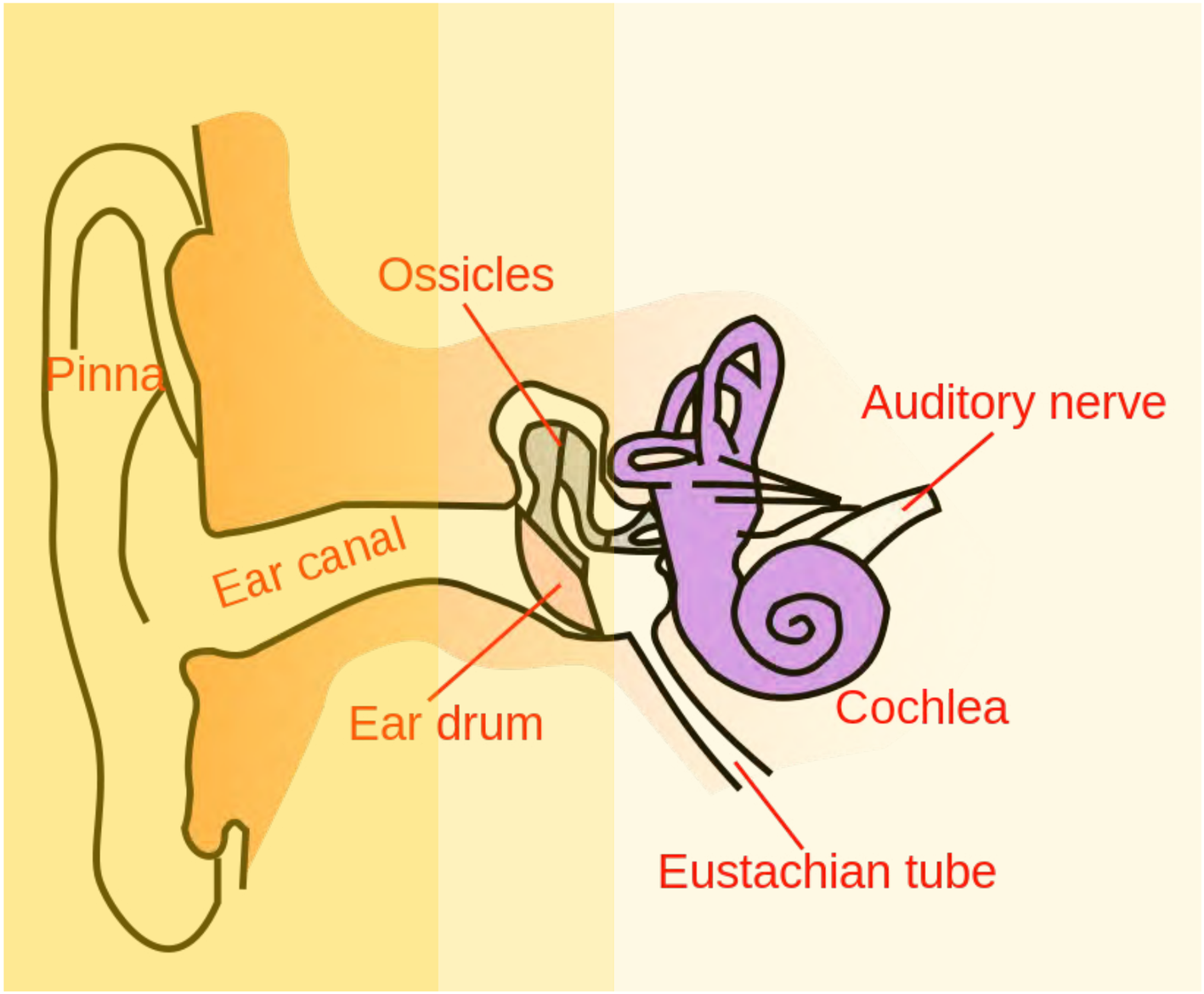
Sound Is a vibration in an elastic medium. An elastic medium is any material (air, water, physical object, etc.) that has the ability to return to its normal state after being deflected by an outside force such as a sound vibration. The more elastic a substance, the better it is able to conduct sound waves.

Hearing is the human ability to process auditory sounds. The anatomy that allows for this ability is categorized into three parts; the inner, middle, and outer ear.

The outer ear is made up of the outer flap of skin, the pinna, and the ear canal. The outer ear funnels the mechanical wave of sound in air as alternating pressures to the middle ear.

In the middle ear, the mechanical wave from the outer ear is transformed into vibrations which pass through the ossicles to the ear drum. The ossicles are tiny bones which serve as drumsticks to the ear drum.

Differing from the middle ear which is an air cavity, the inner ear has a fluid filled cavity consisting of semi-circular canals and the cochlea. The semi-circular canals accelerate the pulses of the ear drum and help maintain bodily balance. The cochlea serves in one of the most important processes to hearing. Inside the cochlea exist numerous tiny hairs of slightly varying lengths. Each hair recognizes the vibration of a singular pitch and sends electrical impulses to the auditory nerve to the brain.



There are a variety of hearing disabilities which are important to consider. The categories are as follows:

Degree of hearing loss
- Varying degrees of hearing loss, from a slight impairment to fully destructive loss.

Conductive hearing loss
- Conductive hearing loss consists of an issue causing sounds to be lost in transmission from the outer to middle ear.
- Conductive hearing loss can usually be aided to some degree with surgeries and medical therapy.
- Conductive hearing loss usually results in difficulty hearing softer sounds and higher frequencies.

Sensorineural hearing loss
- Sensorineural hearing loss occurs when there are problems with the inner ear.
- Damage to the cochlea and auditory nerve are usually irreversible and result in permanent hearing loss.
- Sensorineural hearing loss results in the inability to hear faint sounds.

Combination hearing loss
- Combination hearing loss is a mixture of conductive and sensorineural hearing loss.

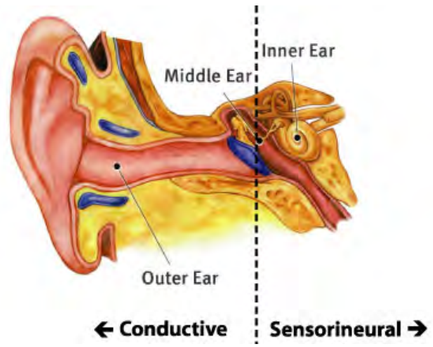
Each type of hearing loss can be configured differently for every individual, The differing configurations are as follows:

Bilateral/Unilateral
- One ear (unilateral), or two ears(bilateral)

Symmetrical/Asymmetrical
- Equal on both sides (symmetrical), or unequal (asymmetrical)

Progressive/Sudden
- Hearing loss that gradually gets worse (progressive), or that occurs immediately after an event (sudden)

Stable/Fluctuating
- Hearing loss that is constant in level (stable), or hearing loss that changes in severity (fluctuating)



- About 2 to 3 out of every 1,000 children in the United States are born with a detectable level of hearing loss in one or both ears. More than 90 percent of deaf children are born to hearing parents.
- One in eight people in the United States (13 percent, or 30 million) aged 12 years or older has hearing loss in both ears, based on standard hearing examinations.
- Men are more likely than women to report having hearing loss.
- About 2 percent of adults aged 45 to 54 have disabling hearing loss. The rate increases to 8.5 percent for adults aged 55 to 64.
- Nearly 25 percent of those aged 65 to 74 and 50 percent of those who are 75 and older have disabling hearing loss.
- The NIDCD estimates that approximately 15 percent of Americans (26 million people) between the ages of 20 and 69 have high frequency hearing loss due to exposure to noise at work or during leisure activities.
- Roughly 10 percent of the U.S. adult population, or about 25 million Americans, has experienced tinnitus lasting at least five minutes in the past year.
- Among adults aged 70 and older with hearing loss who could benefit from hearing aids, fewer than one in three (30 percent) has ever used them. Even fewer adults aged 20 to 69 (approximately 16 percent) who could benefit from wearing hearing aids have ever used them.
- As of December 2012, approximately 324,200 people worldwide have received cochlear implants. In the United States, roughly 58,000 adults and 38,000 children have received them.
- Five out of 6 children experience ear infection (otitis media) by the time they are 3 years old.

Source: National Institute on Deafness and Other Communication Disorders

Sound

Sound vibrations travel through elastic mediums in the form of small pressure changes alternating above and below the static (at rest) nature of the conducting material. Each of these compression/rarefaction cycles is called a *wave.*

The number of waves that occur per second is termed ***frequency***. Frequency is measured in terms of hertz (Hz). One Hz is equal to one cycle per second.

The ***amplitude*** of sound waves – how far they travel above and below the static pressure of the elastic medium they are traveling through – is measured in decibels (dB). The higher the decibel level, the higher the volume, or loudness of a sound.

Sound Movement

Sound moves through building spaces in a variety of ways. Most commonly, it is transmitted through air. But wall partitions, ceilings and floor/ceiling assemblies can also transmit both airborne sound, such as human voices and ringing telephones, and impact sound, such as footsteps on a floor. Sound waves actually travel through many physical objects faster and with less loss of energy than they travel through air. Sound waves travel at a rate of 1,128 feet per second through air (at 70 degrees F); 11,700 feet per second through wood; and 18,000 feet per second through steel.

Sound ***reflection*** occurs when sound waves bounce off smooth, hard wall, ceiling and floor surfaces. Concave surfaces tend to concentrate or focus reflected sound in one area. Convex surfaces do just the opposite; they tend to disperse sound in multiple directions.

Sound reverberation is the persistence of sound reflection after the source of the sound has ceased. Reverberation can have both a positive and negative effect in architectural design. For example, specifying highly reflective ceiling panels directly above the stage area in an auditorium will help direct sound toward specific seating areas, thus enhancing the room's acoustical performance. However, that same reflective performance will become a negative factor if highly reflective wall and ceiling materials are installed in the rear of the auditorium. That's because the sound reflections from the rear of the room take too long to reach the audience, resulting in a distracting echo effect.

Sound can also diffract, or bend and flow around an object or through a small space or opening. This gives sound waves the ability to "squeeze" through very small openings with little loss of energy. The small openings under and around doors, floor tracks, electrical boxes and conduit and HVAC ducting are typical sources of sound diffraction. These are commonly referred to as "flanking" or "leaking" paths. They can be controlled by the proper application of acoustical sealant.

Isolating Sound

A primary goal of a wall partition, ceiling system and floor/ceiling assembly design is to minimize the flow of airborne and impact sound through the use of special materials, methods of construction and designs. The effectiveness of an assembly's ability to isolate airborne sound is quantified by ***Sound Transmission Class (STC)*** ratings. STC is expressed as a single number and usually ranges from approximately 35 to 70. It quantifies the transmission loss (TL) of an assembly.

A wall partition or floor/ceiling assembly that reduces the overall incoming sound levels from 80dBA to 20dBA would have an STC rating of approximately 60.

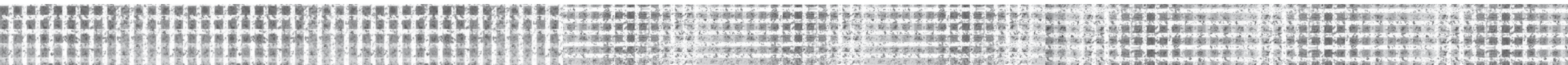
A related measurement is ***Ceiling Attenuation Class (CAC).*** This rating quantifies how much sound is lost when it is transmitted through the ceiling of one room into an adjacent room through a common plenum. Like STC, a higher CAC rating indicates that the ceiling system allows less sound transmission. For closed-office environments, a CAC of 40 to 44 is usually desirable.

Impact sound transmission in a floor/ceiling assembly is quantified by ***Impact Isolation Class (IIC).*** This is a single number rating that quantifies an assembly's ability to isolate impact sounds generated from footsteps and other impact sources. It is tested in laboratory conditions by a tapping machine that impacts the floor of a "source" room. The sound of the tapping is measured in a "receiving" room, located directly beneath the source room.

Wall Partitions and STC

Reducing sound transmission through wall partitions can be

SOURCE: AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION



accomplished in a variety of ways, including isolation (the separation of adjoining wall partition surfaces), mass, absorption, decoupling (inelasticity) and the elimination of flanking paths (sound leakage). Increasing the mass of a partition forces sound waves to work harder and expend more energy to pass through the medium. Specifically, doubling the mass of a partition can reduce sound transmission by up to 5dB.

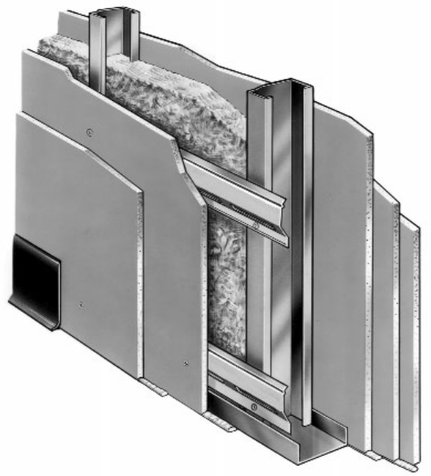
However, using mass alone to increase sound control has definite limitations. To achieve a 60dB reduction, a total mass of 320 pounds per square foot is required. This is equivalent to approximately 3 feet of solid concrete, which is obviously impractical for virtually any building design. Isolating air space within a partition is an effective means for raising STC performance, but like mass, it has its limitations. Doubling the partition air space can reduce sound transmission by up to 5dB, but to achieve a reduction of 60dB requires an isolated air space 4 feet wide. Again, this is hardly practical for building design. The effectiveness of air isolation is limited by the fact that the wood or steel studs attaching both sides of the partition assembly transmit sound no matter how wide the isolated space. Like electricity, sound waves seek the path of least resistance, which in this case is the structural framing. Adding a layer of fibrous sound-absorbing insulation material, such as mineral wool, into the partition cavity dissipates sound by creating friction, which transforms sound energy into heat.

Again, however, the effectiveness of sound attenuation blankets is limited by the presence of studs, which provide a direct route for sound waves to travel through the assembly. Decoupling the partition through the use of ***resilient channels***, which decouples the surface diaphragm from the structural member, increases the effectiveness of both air isolation and absorption. Resilient channels are attached to framing, with the attachment leg facing down. The screws attaching the gypsum panels should not penetrate through the channel and into the stud, as this negatively impacts resilient channel acoustical performance.

Finally, sealing flanking paths (small air gaps that enable sound to travel with little energy dissipation) is a critically important factor in controlling sound transmission. A properly sealed wall assembly featuring two layers of 5/8-inch gypsum board on both sides and a 1 1/2-inch thick sound attenuation blanket achieves an STC of 53. The same wall without the acoustical sealant has an STC of approximately 29 – a dramatic difference. The key is to apply an adequate bead of acoustical sealant on the outside edge of the floor, ceiling and intersection tracks on both sides of the partition. Applying bead to only one side of the assembly does not fully seal all possible flanking paths. It is necessary to acoustically seal both the space between the floor track and the floor, and between the panel and the track.

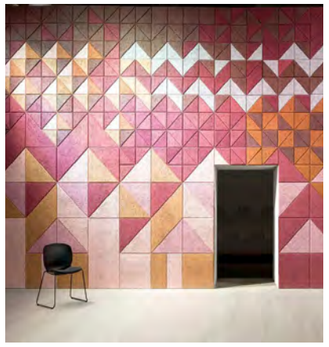
Ceiling Panels and NRC

Another way to control airborne sound within a room is through the use of materials that absorb sound by converting sound waves into heat. The ability of a material to absorb sound is quantified by ***Noise Reduction Coefficient (NRC) ratings.*** NRC represents the average amount of sound energy a material absorbs over frequencies between 250 and 2,000 Hz. NRC values range from 0.00 to 1.00. To have any acoustical value at all, a material must have a minimum NRC of 0.50. That means that the material absorbs 50 percent of the sound and reflects the other 50 percent. An acoustical material that doesn't reflect any sound (it absorbs 100 percent) has an NRC of 1.00. NRC is a key factor in determining the performance of acoustical ceiling panels.



Designing High-STC Wall Partitions: This gypsum board wall assembly uses mass (2 gypsum board layers are on one side, and 3 layers are on the other side), decoupling (resilient channels are screwattached to the steel studs) and absorption (a layer f mineral fiber insulation is friction-fitted in the partition cavity) to enhance STC performance.

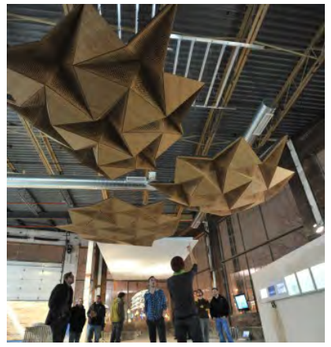
SOURCE: AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION
NOTE: IMAGE HYPER-LINKED TO SOURCE



Wood Wool Tiles
by Baux

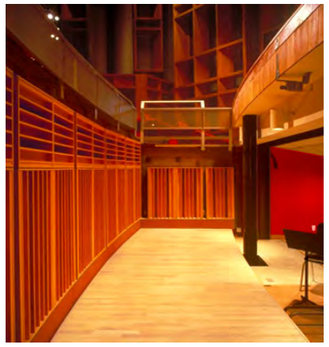
Wood Wool Tiles
by Baux

Cube Panels/Pendants
by Carpet Concept



Resonant Chamber
by rtvr

Square Baffles
by OWA

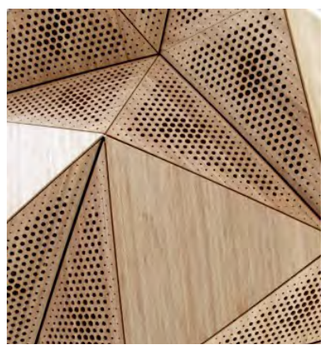


QRD 734 Diffusor
by RPG

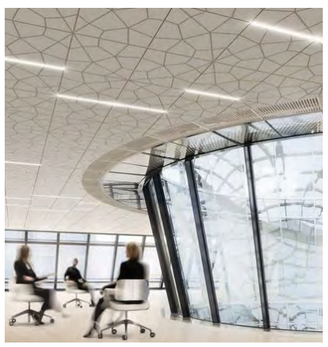
Ginko Tiles
by Blå Station

Wool Bubbles
by Wobedo

Buzzishade Pendant
by Stal Collectief



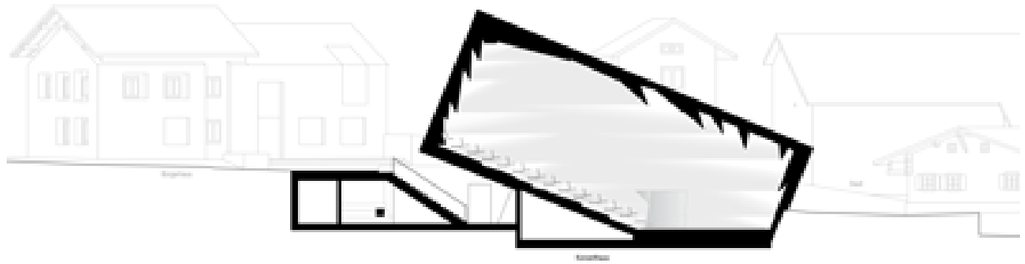
Resonant Chamber
by rtvr

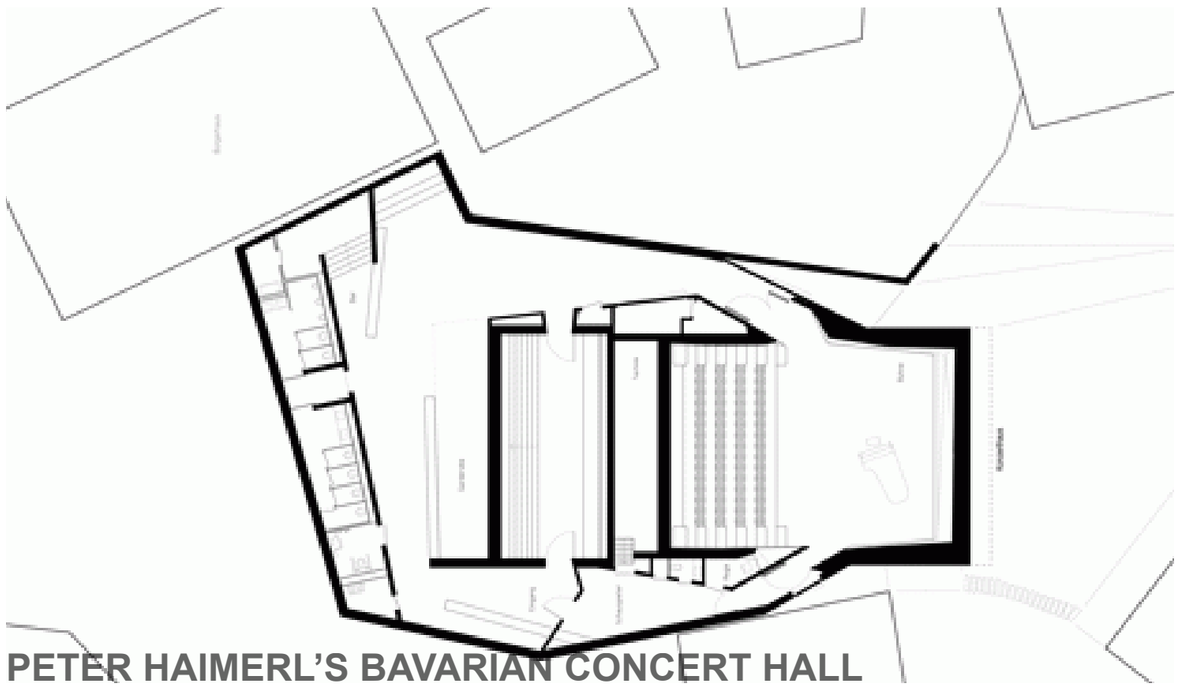


Oriental Tiles
by OWA

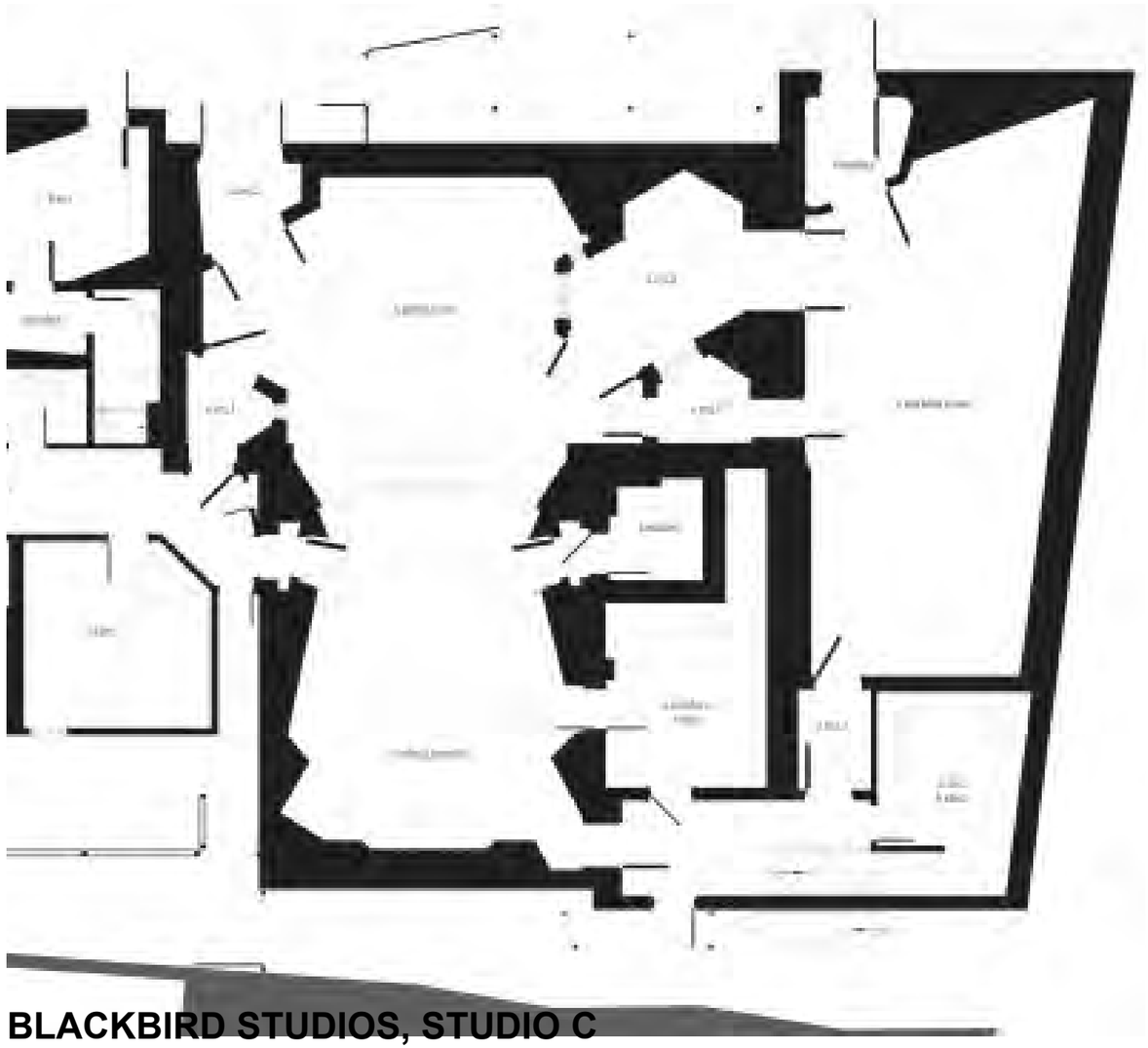
QRD 734 Diffusor
by RPG

NOTE: IMAGES HYPER-LINKED TO SOURCE

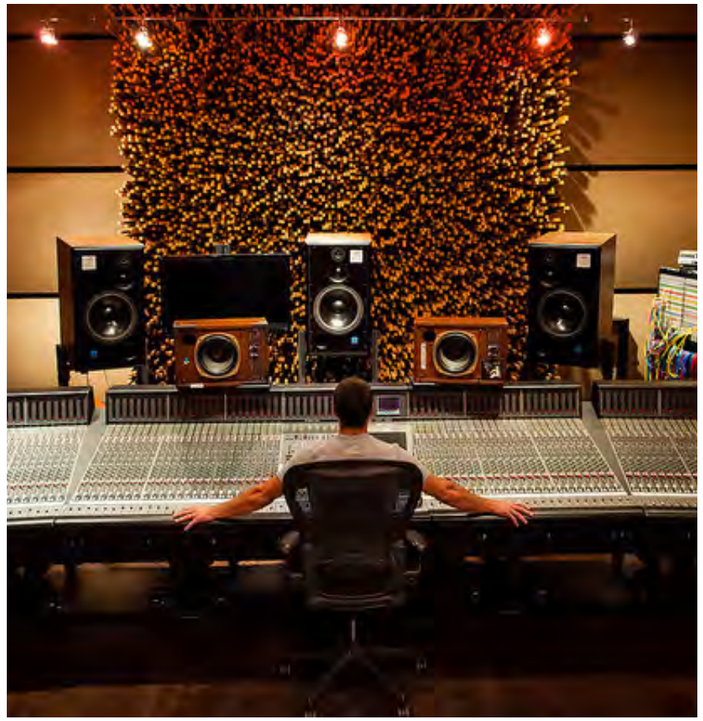




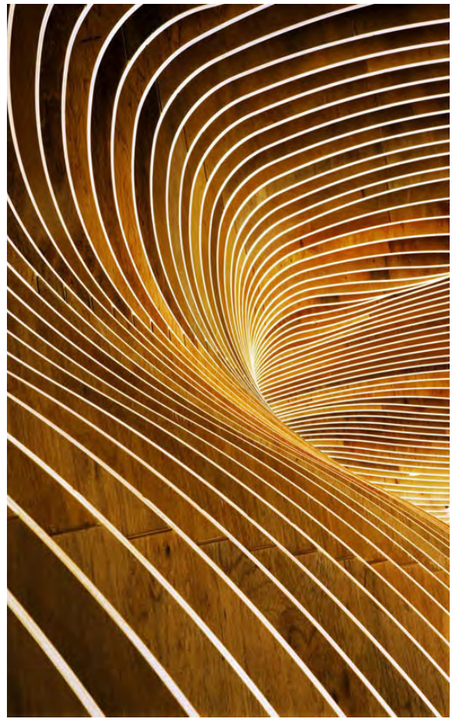
PETER HAIMERL'S BAVARIAN CONCERT HALL



BLACKBIRD STUDIOS, STUDIO C



GENEXIS THEATER, FUSIONOPOLIS BY ARUP/WOHA



SOUND+SPACE

Soundscapes, Sound Maps, & Sound Art

Soundscapes

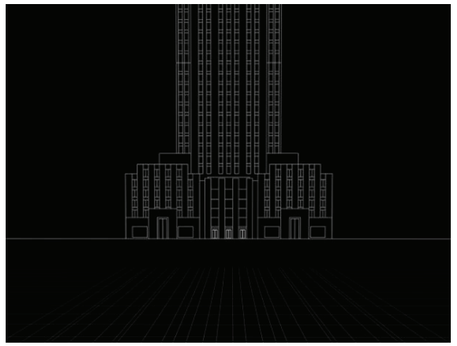
The term 'soundscape' refers to the sound environment of a specific place. It may refer to actual interior or exterior environments, or to abstract constructions such as musical compositions. A soundscape refers to something purely auditory, not visual; this gives artists and designers the opportunity to visually represent soundscapes however they choose.

On the website "Soundscape Architecture," Karen Van Lengen has created animations to accompany the soundscapes of several iconic buildings. The project is a means of drawing attention to the audio experience of a building, which she believes is sometimes overlooked in architecture.

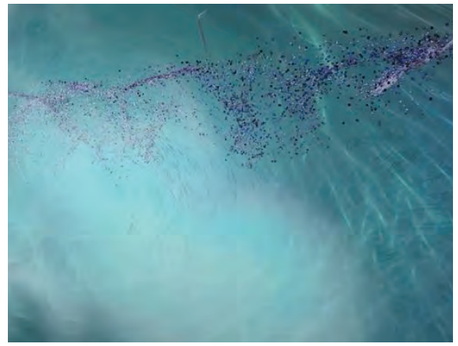
http://soundscape.iath.virginia.edu/

Guggenheim Museum

Seagram Building



Grand Central Station



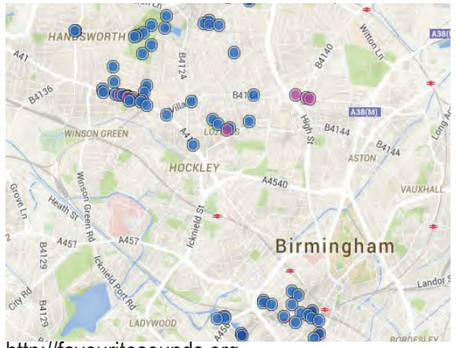
Others look to new technologies to visually depict recorded soundscapes. Drew Allan and Andy Huntington create 3D printed sculptures of various soundscapes, taking sound frequencies within the range of human hearing over a short period of time. "These samples were taken from music, but also from spaces, creating site-specific sculptures reflecting the acoustic of an environment. The frequencies were rendered in a tangible and permanent manner, as sculptures representing a sample of time."

http://andyhuntington.co.uk/2003/cylinder/

Sound Maps

http://www.naturesoundmap.com

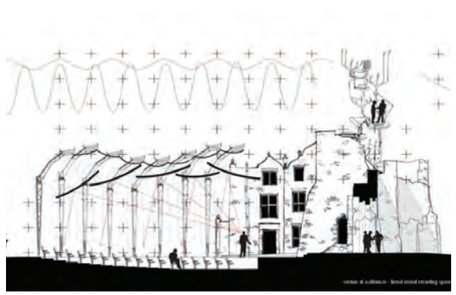
http://www.nysoundmap.org

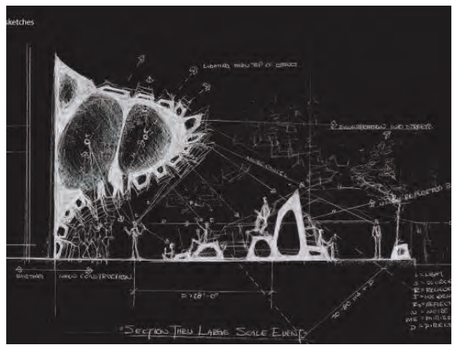


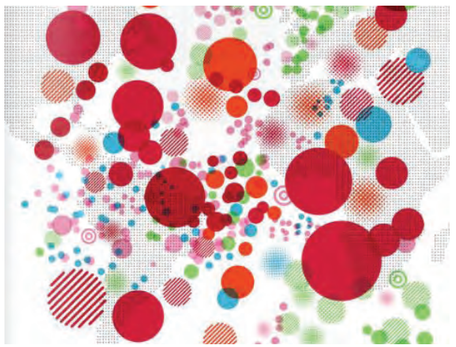
http://favouritesounds.org

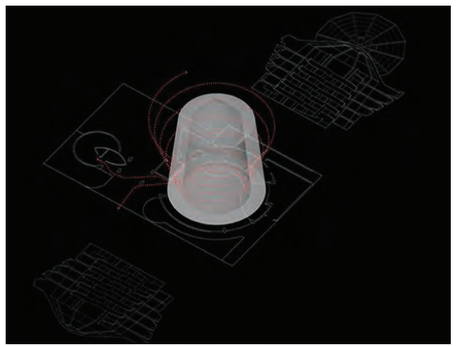
"Sound maps are digital geographical maps that put emphasis on the sonic representation of a specific location. Sound maps are created by associating landmarks (streets in a city, train stations, stores, pathways, factories, oil pumps, etc.) and soundscapes." (Wikipedia)

"The objective of sound maps is to represent a specific environment using its *soundscape as primary references as opposed to visual cues*."





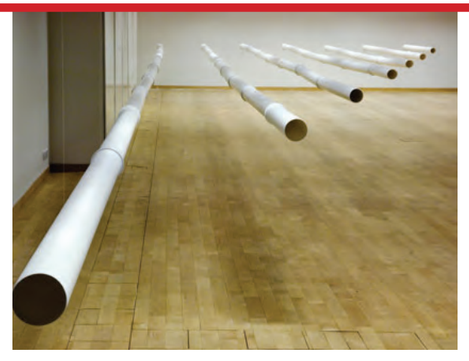




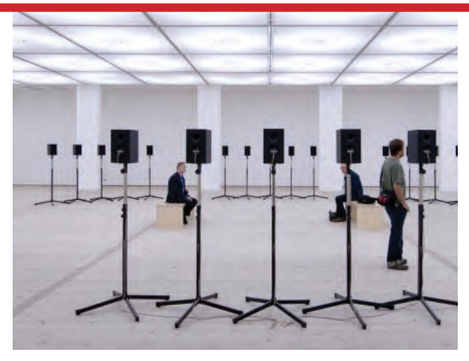
What if we began to think about sound maps in a different way, perhaps as a graphic tool to inform and describe spatial experiences?

Sound Art:
Experiential Concepts

Aritmetiche Architetture Sonore (2012)
Roberto Pugliese
Various speakers are suspended by braided steel cables anchored to the walls in order to transmit synthetic sounds in coherence with the visual aspects.
Website: http://www.robertopugliese.com/page2/page63/page63.html
Video: https://www.youtube.com/watch?v=I7fPUOftAe8



Tesla Tune (2014)
Finboggi Petursson
The sounds emitted from the Tesla Tune installation comes from an alternating current transformer that channels sound through seven pipes of various lengths.
Website: http://www.finnbogi.com/works.htm
Audio: https://soundcloud.com/finnbogi-petursson/teslatune-2014-wsg-pittsburgh-1



The Forty Part Motet (2001)
Janet Cardiff
Cardiff's installation is a reworking of a choral piece for forty male voices by Tudor composer Thomas Tallis. The speakers are arranged in a large circle, and as visitors wander among them they hear all forty voices as they unify into one musical piece.
Article: http://www.moma.org/collection/browse_results.php?object_id=87291
Video: https://www.youtube.com/watch?v=ncWFLzVrwU4

The Transfinite (2011)
Ryoji Ikeda
Ikeda creates a huge, immersive, electronic light-and-sound installation where visitors are submerged into an extreme visual and sonic environment.
Website: http://www.ryojiikeda.com/project/the transfinite/
Video: https://www.youtube.com/watch?v=omDK2Cm2mwo

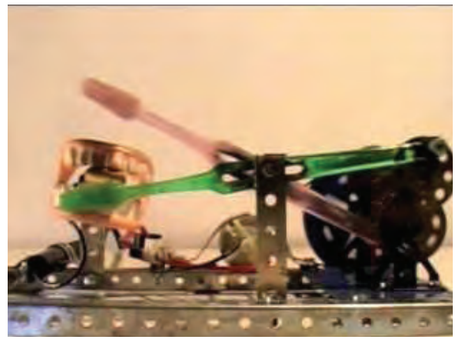
Conveyer (2000)
MW Burns
Burns' installation emits a dense rumble, heard from a distance and emitted from wall mounted speakers, which gradually coheres into the sound of many simultaneous voices. "You have to stick your ear right into one of them to catch the story."
Website: http://dotminus.net/id9.html
Audio: http://dotminus.net/sitebuildercontent/sitebuilderfiles/conv

Sonic Seascape Terrace (2011)
Marianne Decoster-Taivalkoski, Hanna Haaslahti & Alejandro Montes de Oca
Underwater microphones capture the soundscape from deep within the nearby river. Speakers embedded within the walls of the riverside pavilion emit the real-time sound through small holes.
Article: http://www.dezeen.com/2011/09/14/sonic-seascape-terrace-by-decoster-taivalkoski-haaslahti-and-montes-de-oca/
Video: http://vimeo.com/28651193

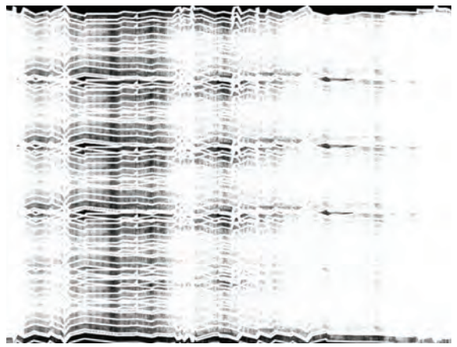
Sound Art:
Potential Exhibits

Eprom
Alberto Tadiello
This is an installation consisting of wiring, transformers and electric motors which drive music boxes, to create something that borders visual and auditory sensations, becoming nearly tactile.
Website: http://7electrons.tumblr.com/post/80972409627/alberto-tadiello-joins-us-on-7e-alberto-is-an#.VMFnR0fF_d0
Video: https://www.youtube.com/watch?v=0uCVozemN7M

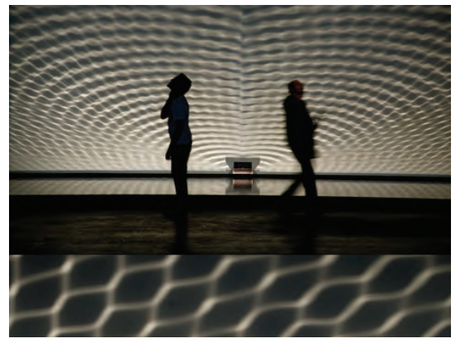
“Vinyl” Ice Records (2005)
Lyota Yagi
Yagi demonstrates cast the rings of a record into ice which melt away as the song plays. The varying length and nature of the performance are unique to specific conditions like weather, temperature, and audience.
Video: https://www.youtube.com/watch?v=WZAE5e41gAc



Mecanologie (1997)
Pierre Bastien
This ensemble uses various automatons which play a short melody, a rhythm or some harmony repeated in a loop. But instead of music instruments, the robots make daily life objects sounding – a teapot, a comb, some tooth brushes, a saw, an ashtray, some scissors, a letter-scale and a hammer.
Website: http://www.pierrebastien.com/en/installations.php
Video: https://www.youtube.com/watch?v=UE7eSN63N7Y



Soundscape (2013)
Maciej H. Zdanowicz
Soundscape is a visual representation of the experience of a crowded city street. Zdanowicz overlays individual sound waves, blurring and melding them together to show fluctuation in the frequency and intensity of sounds.
Website: http://www.artysci-lodzkie.pl/en/artist/z/maciej-zdanowicz/



Earth (2009)
Finboggi Petursson
Petursson turns intangible entities, like sound, into visible phenomenon. The sound waves coming from loudspeakers combine with water to produce real water waves and create forms consisting not of visible marks but of invisible sound waves.
Website: http://www.finnbogi.com/works.htm
Video: www.youtube.com/watch?v=ZbUY8y-JhAI

Object Opera (1984-97)
Ken Butler
Butler’s hybrid instruments exist as ergonomic functional musical instruments as well as sculpture; when amplified they are shaped with cutting edge sound processing, allowing artful musical sounds.
Website: http://kenbutler.squarespace.com/installation/
Video: http://youtu.be/QBRkjp49fIE

Sound Art: Sound Installation Artists

Alejandra + Aeron – www.alejandra-aeron.com

Miguel Alvarez-Fernandez – miguelalvarezfernandez.wordpress.com

Baschet Brothers - francois.baschet.free.fr/front.htm

Richard Chartier - www.3particles.com

Timo Kahlen – www.timokahlen.de

Viacheslav Koleichuk - monoskop.org/Viacheslav_Koleichuk

Christina Kubisch - www.christinakubisch.de

Yuri Landman - www.hypercustom.com

Janet Cardiff + George Bures Miller - www.cardiffmiller.com

Paul Panhuysen - www.paulpanhuysen.com

Don Ritter – www.aesthetic-machinery.com

Pipilotti Rist – www.pipilottirist.com

Ulrich Eller – www.ulricheller.de

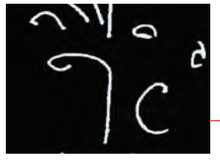
Zimoun – www.zimoun.net

Sound Art:
Composers / Performance Artists

Maryanne Amacher - maryanneamacher.org

Laurie Anderson - www.laurieanderson.com

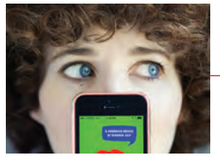
Magali Babin - www.magalibabin.com



William Basinski - www.mmlxii.com

Jaap Blonk - www.jaapblonk.com

Poulomi Desai - poulomidesai.tumblr.com



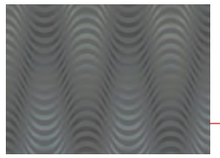
Miranda July - mirandajuly.com

Georges Lentz - www.georgeslentz.com

Augustine Leudar - www.augustineleudar.com/installations

Arto Lindsay - artolindsay.com

Abinadi Meza - abinadimeza.blogspot.com



Tristan Perich - www.tristanperich.com

Hans Reichel – www.daxo.de

Elliot Sharp – www.elliotsharp.com

Meredith Monk – www.meredithmonk.org

Thomas Truax – www.thomastruax.com

COLLECTIONS

Exhibit Design

The current Museum of Magnetic Sound Recording features over 200 wire and tape recorders as well as microphones in their collection that represent the technological development of sound.

Their mission is to display sound recording equipment and educate the visitors about the importance of the technology.

Here are 7 landmark devices that represent the collection comprehensively. As well as a timeline of the history of audio recording.

Edison Cylinder Player

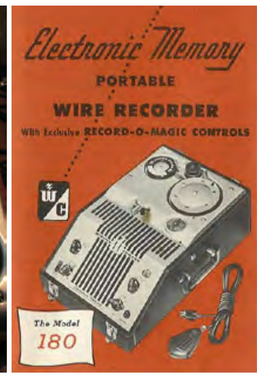
In 1904, it had the first ability to reasonably reproduce sound vibrations. The recording technology was first developed when Edison was trying to improve upon the telegraph transmitter. He noticed that the movement of paper through the machine produced noises much like that of spoken word when played at a high speed. Through a series of iterations, he developed the concept for the phonograph, Edison intended it for dictation, but music became the most marketable use. This technology quickly became commercialized with the use of cylinders to record and play sound. Wax was originally introduced as the recording medium for the cylinder, but by the 1900s this was replaced by a mass-produced cylinder made from cellulose.

Events
- Bell telephone company forms
- Emile Berliner invents flat disk phonography records
- St. Louis World's Fair inspired the song "Meet Me in St. Louis, Louis"
- George M. Cohan's 1st major play debuts featuring "Yankee Doodle Dandy" and "Give my Regards to Broadway"

Ampex 200A recorder

Ampex was founded in 1944 and became the first American company to produce a professional recorder. The Ampex 200-A cost them approximately $76,000 to develop. Ampex was backed and funded by singer, Bing Crosby and the recorder was utilized by recording studios and broadcast stations. The design was based on the German Magnetophon recorders brought back to the US by John "Jack" T. Mullin after WW II. This Museum's 200A is one of only 112 made and 1 of 3 available for public display.
It is our hope one day we'll have the only Ampex 200-A working and available for full demonstration. The acquisition of the 200A greatly increased the significance of our collection. The recorder was full track using 14 inch reels, 1/4 inch tape and was capable of a performance that was flat within .5 dB from 30 hz to 15 kHz. Weighs 240 lb. and is roughly 40" x 38".

Events
- Musicians strike against major recording companies because of conflict over royalties.



Webster Chicago 180-1 wire recorder

Designed in 1948 for low cost, semi-professional recording. This device put the ability to record in the hands of the everyday person. The recordings were permanent and could be replayed thousands of times. A new recording could be made by recording over the same wire.

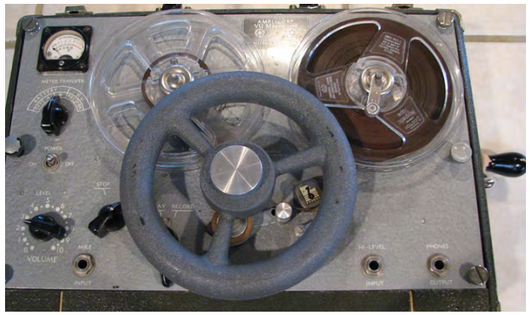
The first wire recorder was invented in 1890 and was used by the US during WWII. However this technology was out of date by this point. Germany had developed magnetic tape recorders in 1935 and used then extensively in the war. By 1950, the wire recording format was outdated sue to lack of fidelity and editing.

Events
- Rock & Roll was born
- 1st jazz festival featuring Louis Armstrong, Django Reinhardt, Claude Luter
- Columbia records introduce the long play vinyl record, could hold 30 min of music on each side.
- Transistor is patented for radio & television, replaced bulky vacuum tubes
- Leo Fender releases the first mass produced electric guitar, Broadcaster

ReVox T-26 Dynavox

This recording device developed from 1949-1951 and launched one of the worlds most respected recorder manufacturers, Willi Studer.
The Dynavox tape recorder was renamed into Revox T26 and the prestigious recording of the “International Music Festival Lucerne” was made with a prototype of the first professional tape recorder Studer 27. The T26 continued virtually unchanged until cessation of production in 1955. Used in recording studios around the world for music and film. Many of these are still in use today as musicians love the analog sound. Reels have a diameter 7”, moves 7.5 ips and weighs 36 lb.

Events
- Popularity of Big Band music declines
- Bebop emerges into the realm of music



Amplicorp Magnemite 610 VU

Designed in 1958, this wind up on location recorder enabled professional field recording for radio and film. It is battery operated, and very compact and light-weight. This device uses two clear channels for recordings that can be fed into any dual channel amplifier. “Ideal for any expedition, heading anywhere in the world.”

The recorder is 8.5 x 11 x 10in. and weighs 17 lbs.

Events
- Elvis Presley’s “Jailhouse Rock” tops USA charts
- Connie Francis becomes the leading female vocalist

Roberts / Akai 333X

This recording device developed in the 1960’s captures reel to reel, 8-track, and cassette. It has a one-micron head that makes great frequency responses possible from cartridges and cassettes. Musicians could record their own material before going to a studio.

This device is 10.6 x 13.8 x 18.3 in. and weighs 49.4 lbs. Its power consumption is 60 watts.

Events
- Music festivals emerged such as the Woodstock Music and Art Fair
- Acappella groups became popular
- Popular bands such as The Beatles and The Beach Boys emerged

Teac A-33340

Designed in 1978, this device is a quadraphonic recorder and represents the multi-track recorders. They were attractive to musicians because of their low price and ability to record four tracks. It lead TEAC employees to develop the Simul-Sync technology which eliminated the delay time between playback and recorded tracks when the record and play heads were physically separated.

Its dimensions are 20.55 x 17.32 x 6.69 in. and weighs 49.6 lbs.

Events
- The Sex Pistols play their final show in San Francisco
- Saturday Night Fever becomes a cultural phenomenon
- The musical *Grease* appears as a film

Earliest sound recording, Martinville
The Phonautograph was the first device that could record sound. It was transcribed, seismometer style, onto pieces of paper with no method to play back.

1860

Emile Berliner patents flat-disc gramophone
Gramophone Discs mark the first appearance of commercial music on disc shaped media. The Berliner Gramophone records were lo-fi, delicate and rare.

1887

Telefunken Toschreiber tape recorder

1934

Magnetic Tape, in reel-to-reel form, was the first audio format to play in stereo. Size, price, record ability and content versatility lead to commercial success.

1928

Ampex becomes the first professional US recorder

1948

1944
Ampex founded

8-track Tapes became a popular format with respectable sound quality. They were best suited for the car market.

1968

1877

The Edison cylinder photograph and wax cylinders created. Cylinders were engraved with waveforms read by phonographs. They were the first way that music or voice recordings could be copied and distributed.

1906

Celluloid Cylinders were cheap and sounded as good as wax. They were more durable and long-lived. Celluloid cylinders won over the new music buying public.

1930

Vinyl Discs moved from vulcanite and shellac to vinyl. This brought mainstream stereo playback, the concept of “hi-fi”, double-sided records and true cover art.

1937
Marconi-stille wire recorder

1947
3M introduces 3 lines of record tape

1963

Compact Cassette opened the door to portable listening. The Walkman also gave this iconic media its big break.

1971
Dolby Stereo

1975
DBX introduced

The Mini disc/ATRAC was Sony's attempt at both a new physical media and a digital format. The idea was to match CDs in quality but beat them in size, durability and recordability.

1982
Compact Disc, the CD was high fidelity, extremely durable, and digital superior. It set off a decades-long debate between digital and analog.

1992

1995
MP3s were the first and only digital file format that managed to become a household name, MP3s brought digital music online and into our pockets.

2001
First iPod released

2000
DVD audio and Super Audio CD digital appeals to the audiophile crowd, essentially more capacious versions of the CD.

2003
Apple co-opted a newer audio format for the iTunes Music Store, choosing the AAC codec with a more efficient compression than MP3. The real legacy of these products is DRM with a copy protection lodged into every purchased track.

2004
Garage Band is released by Apple. Now, music could be easily recorded on a laptop, putting the ability to record and produce music into the hands of everyone.

2005
HD DVD

2006
Blu-Ray

2007
First iPhone released

First iPad released

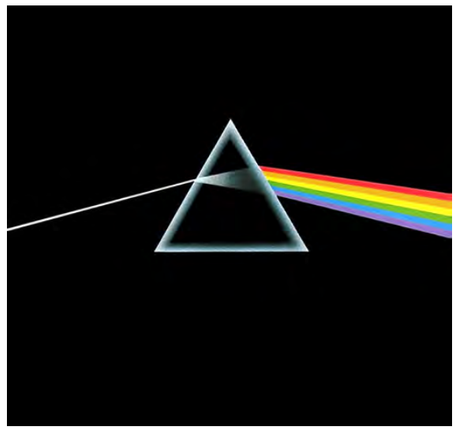
2010
TASCAM creates a portable recorder with pitch control available for a very affordable price of $99

2012
WaveMachine Labs puts Auria on the app market which allows you to record and mix audio on your iPad with the capability to record a full, professional quality production from start to finish.

Dolby Atmos speakers are able to place individual sounds anywhere in a 3D space.

2014
The Blue Mo-Fi headphones are the first high-fidelity headphone with a with a built in audiophile amp.

FAMOUS ALBUM COVER ART GALLERY



GIBSON GUITAR COLLECTION

AUSTIN MUSIC FESTIVAL HALL OF FAME

WHAT IS THE FUTURE OF THE COLLECTION?