



STUDIO
SOUND
SERVICE

The evolution of music production studios:

from commercial recording studio to the
project (production) studio

Who we are

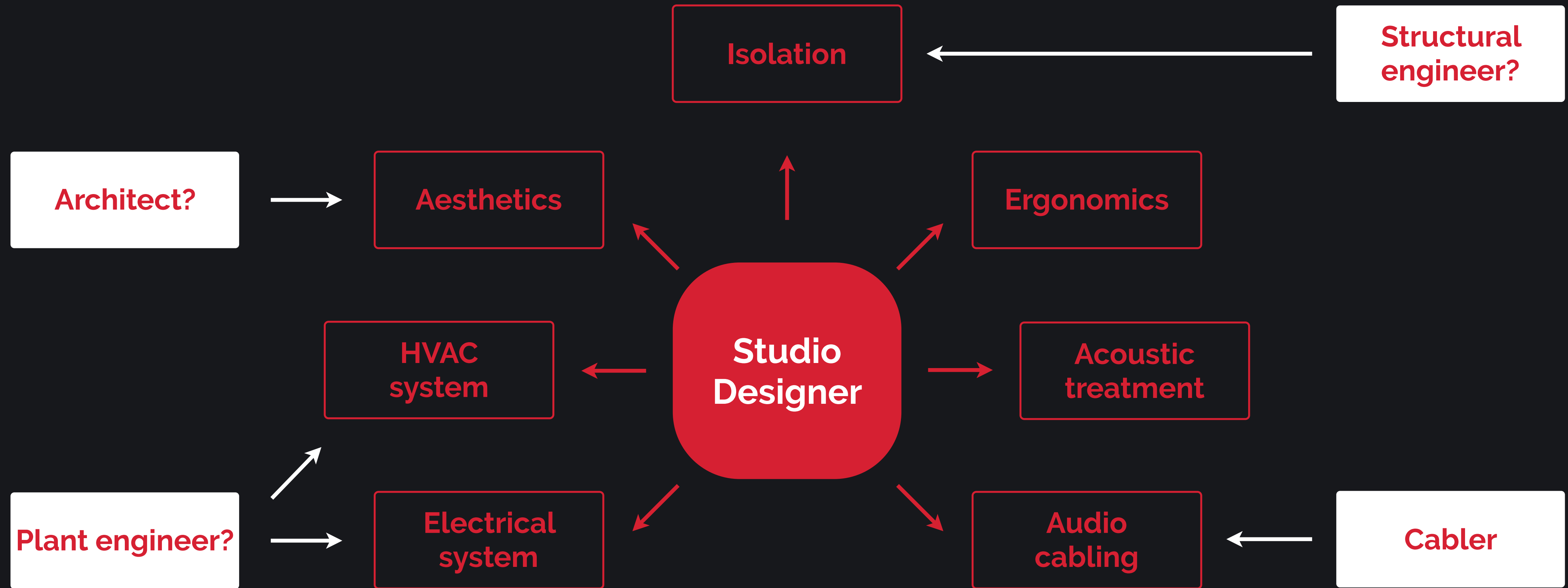


Studio Sound Service is an acoustic design firm, located in Florence, Italy.
Since 1983 we design rooms for music and audio/video production.

Some Projects:

- Barys Arena (ice hockey) @ Astana, Kazakhstan;
- FOX post-production studios @ München (DE);
- FOX post-production studios @ Hammersmith, London (UK);
- D:POT Recording Arts @ Prato – Fabrizio Simoncioni;
- Mulinetti Studio @ Genova – Alberto Parodi (Resolution Award 2015 Best Audio Facility, Nomination);
- The Garage @ Civitella v.d.C. (AR) (Resolution Award 2014 Best Audio Facility, Nomination);
- House of Glass @ Viareggio (LU) – Gianni Bini (Resolution Award 2013 Best Audio Facility, Nomination);
- Damian Lazarus – Monastic Studio @ Vicchio (FI);
- Vinai Studio @ Brescia;
- Renato Zero Studio @ Roma;
- PPG Studios (Andrea Bocelli) @ S. Pietro Belvedere (PI);
- In House (Dolby® approved - Sorrentino) @ Roma;
- George Lucas Home Theater, Italy;
- Chiesa di Santa Maria Nuova (Arch. Mario Botta) @ Terranuova Bracciolini (AR);
- Prada Auditorium and Conference Room via Orobica @ Milano;
- Sala Proiezioni Museo Ferrari @ Maranello (MO).

How are the recording studios designed?



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- A. Acoustic CAD software (EASE, CATT, ODEON) does not work at frequencies below 100 Hz, can not simulate the room's modal response.
 - B. FEM (COMSOL) software can be useful for low frequencies, but they are not so used (there are no "simple" software to use).
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Thus, as a rule, only basic physics, geometry, experience and **standard design** are used

What can not be a recording studio?
(philosophical system)

- A. An anechoic room
(it would be alienating to work for hours !!!)
 - B. A "typical" domestic room
(how big and which country?)
-

How can a recording studio be defined?

**As a place where you can listen
(and work) in a more neutral way**

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(philosophical system)

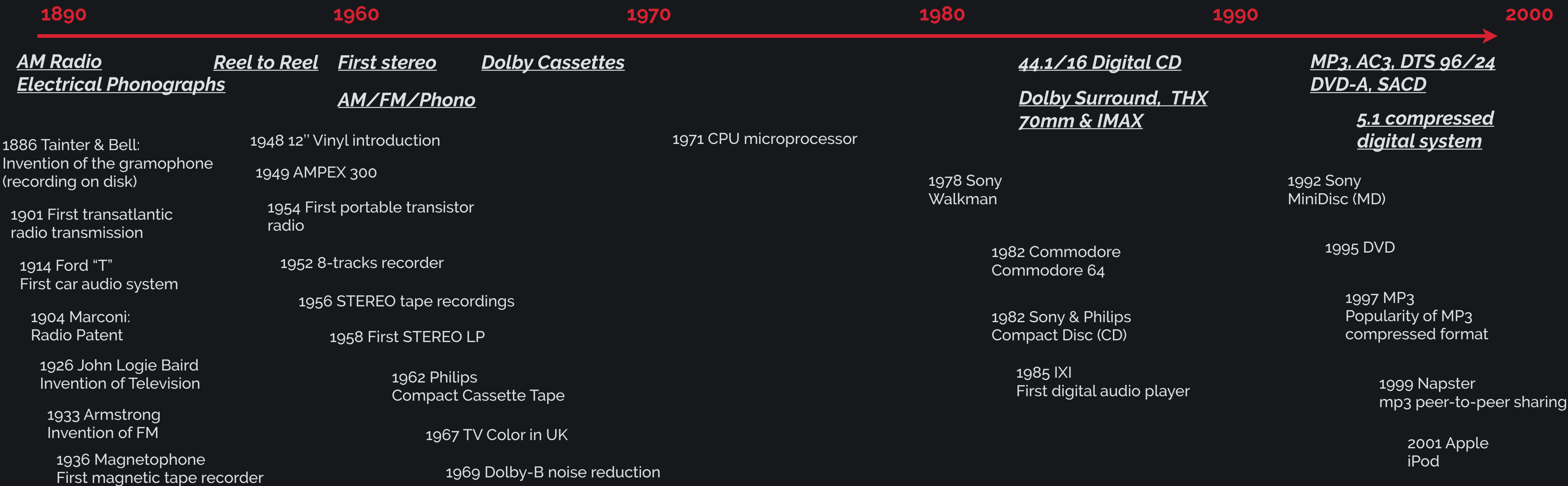
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How can a recording studio be defined?

**As a place where you can listen
(and work) in a more neutral way**

AES, ITU, EBU
Standards and guidelines

1950
First control rooms
(*random design
corner, etc.*)



1950
First control rooms
(*random design*
corner, etc.)

1890

1960

1970

1980

1990

2000

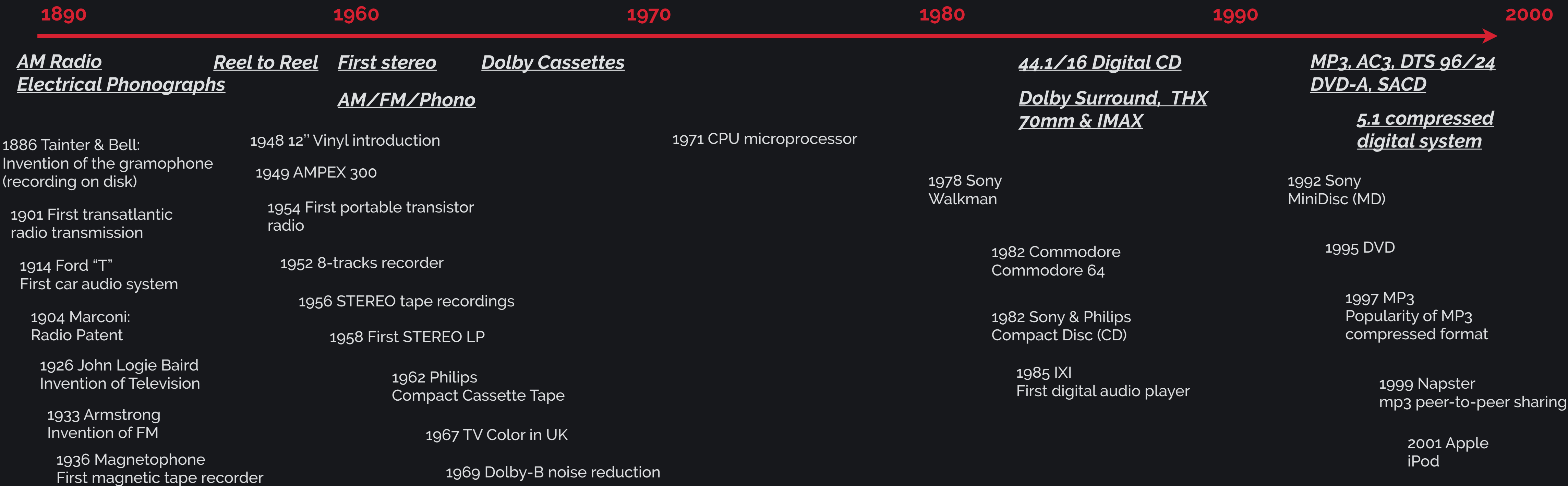
The first control rooms of the '50s were treated in a "casual" way with a little sound absorption and occupied a small part of the studio, at random, like a corner or a closet.

The introduction of the stereo has brought innovation also from the point of view of acoustic design (L / R symmetry).

Horn-Coupled Control Room by
Bill Putnam & Mike Rettinger

1950
First control rooms
*(random design
corner, etc.)*

'60
Tom Hidley
(first bass trap)



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Stereo + music industry -> new control room, new acoustics.

Interview Tom Hidley in which he says that his best listening experience has been on a roof of a house (semi-anechoic room), the diatribe begins between those who prefer "normal" listening and those who want to listen "almost anechoic".

Hidley invents the "Bass Trap" type baffles.

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(*random design
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Tom Hidley
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1. L / R symmetry
2. no reflections from behind (BT)
3. no reflections from the ceiling (BT)
4. reflective front and flush mount
5. side walls partly reflecting and diffused (cabinets, glass, stone)
6. short reverberation even at low frequency

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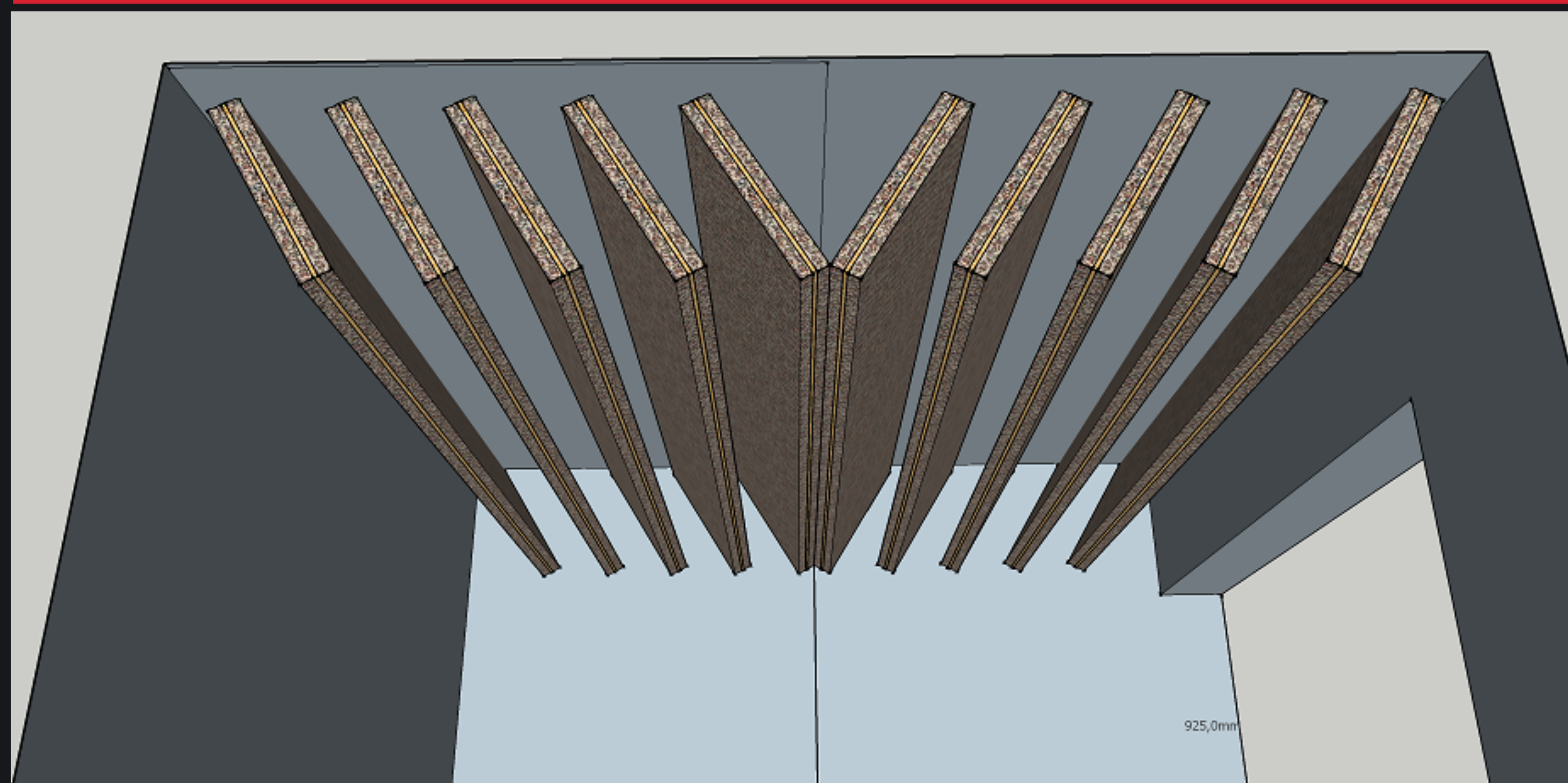
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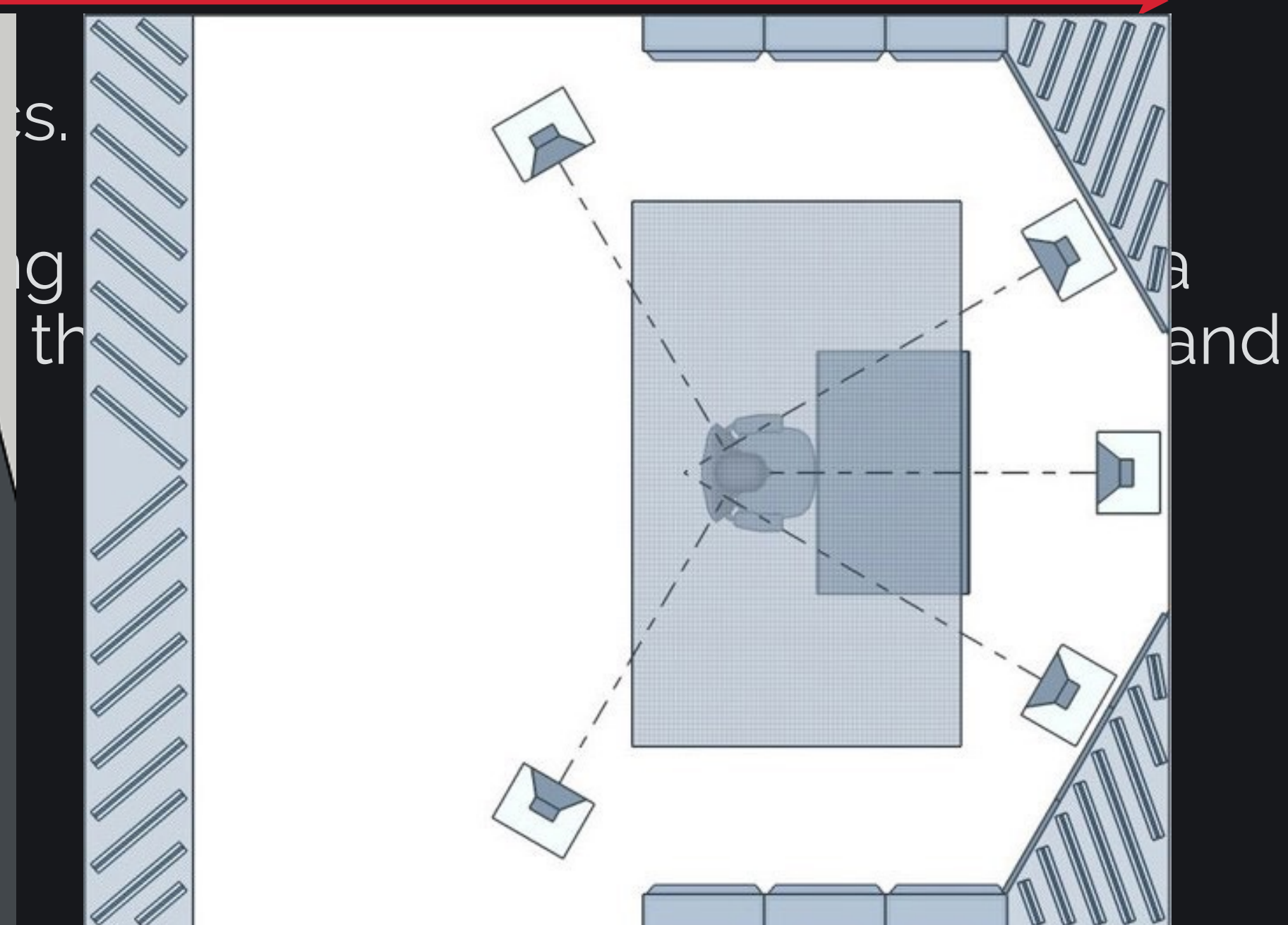
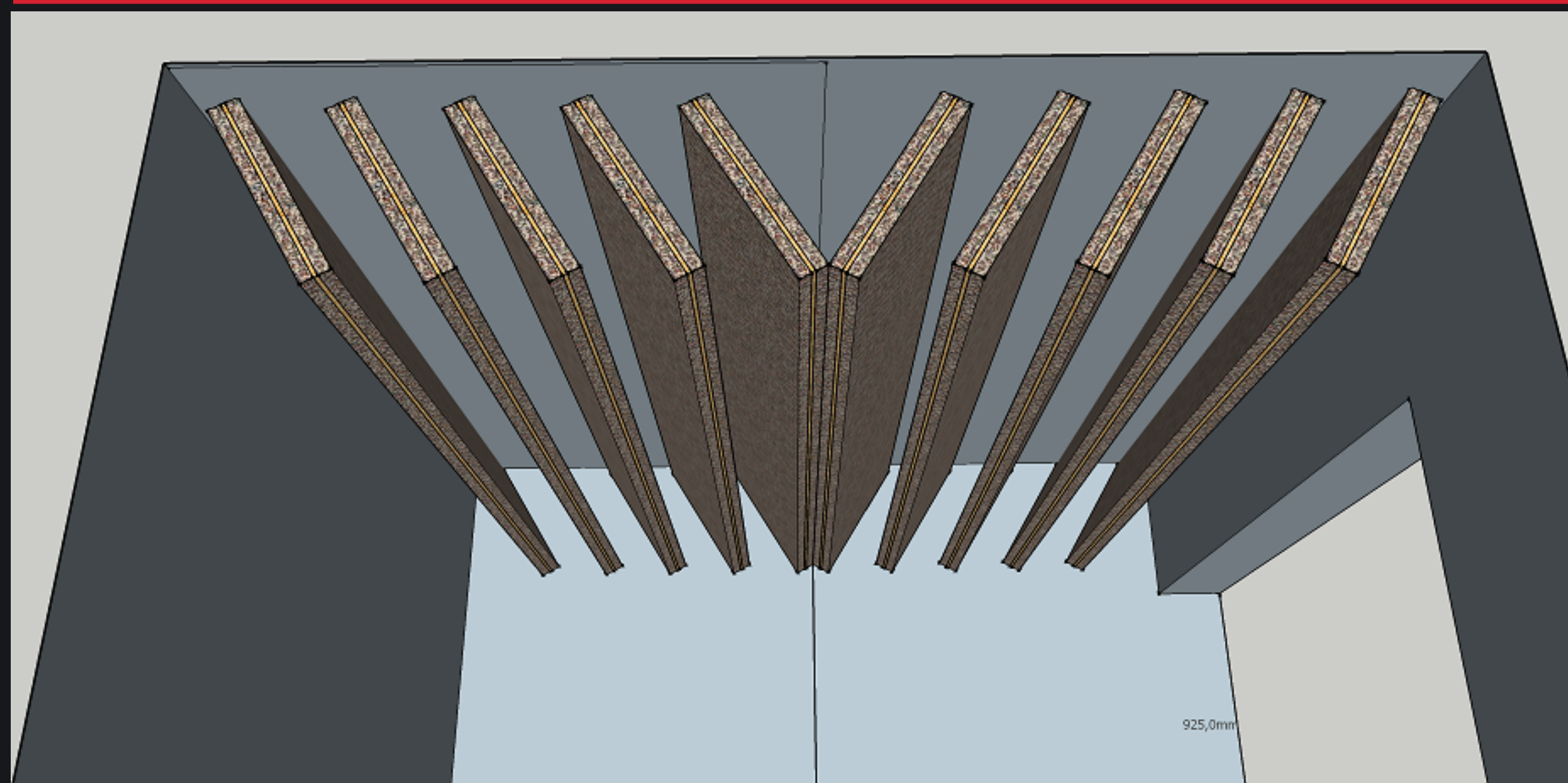
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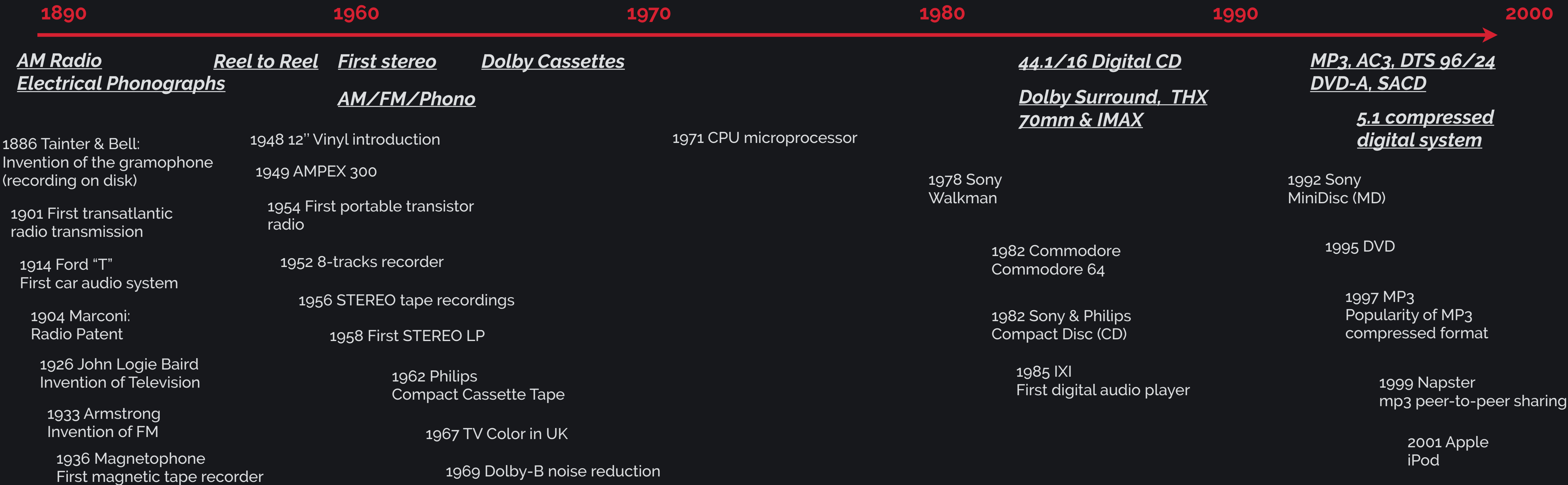
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Time Delay
Spectrometry

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Introduction of TDM to analyze room acoustics is useful for acoustic design.
The first reflections (early reflections) can be noted: the studios done by Tom Hidley, who had a rigid front wall, showed comb-filters at the listening point.

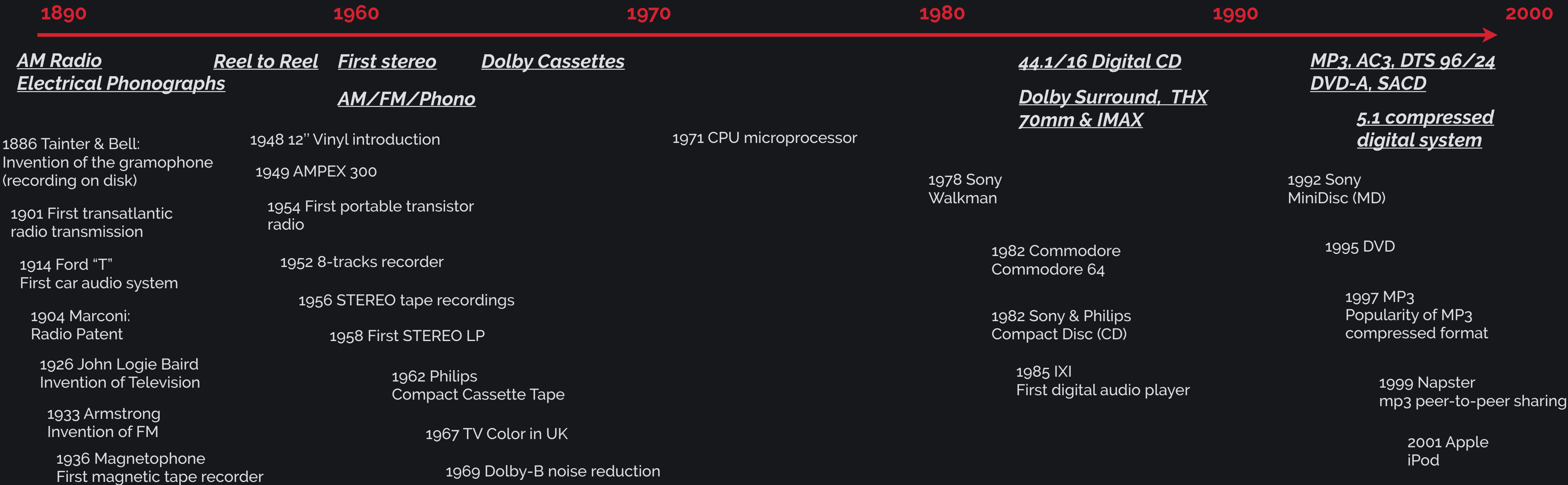
Tom Hidley begins to cover the studio fronts with sound-absorbing material and Chips and Don Davis create the LEDE.

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LEDE, Live End Dead End: the idea, contrary to what was previously proposed, was to make a very absorbing front (Dead End) and a live back, with diffusion (Live End).
The reflections of the back were not to be mirrored, otherwise they brought the same disadvantages of Tom Hidley's forehead.
The Schroeder speaker on the back (QRD - Skyline) was introduced.

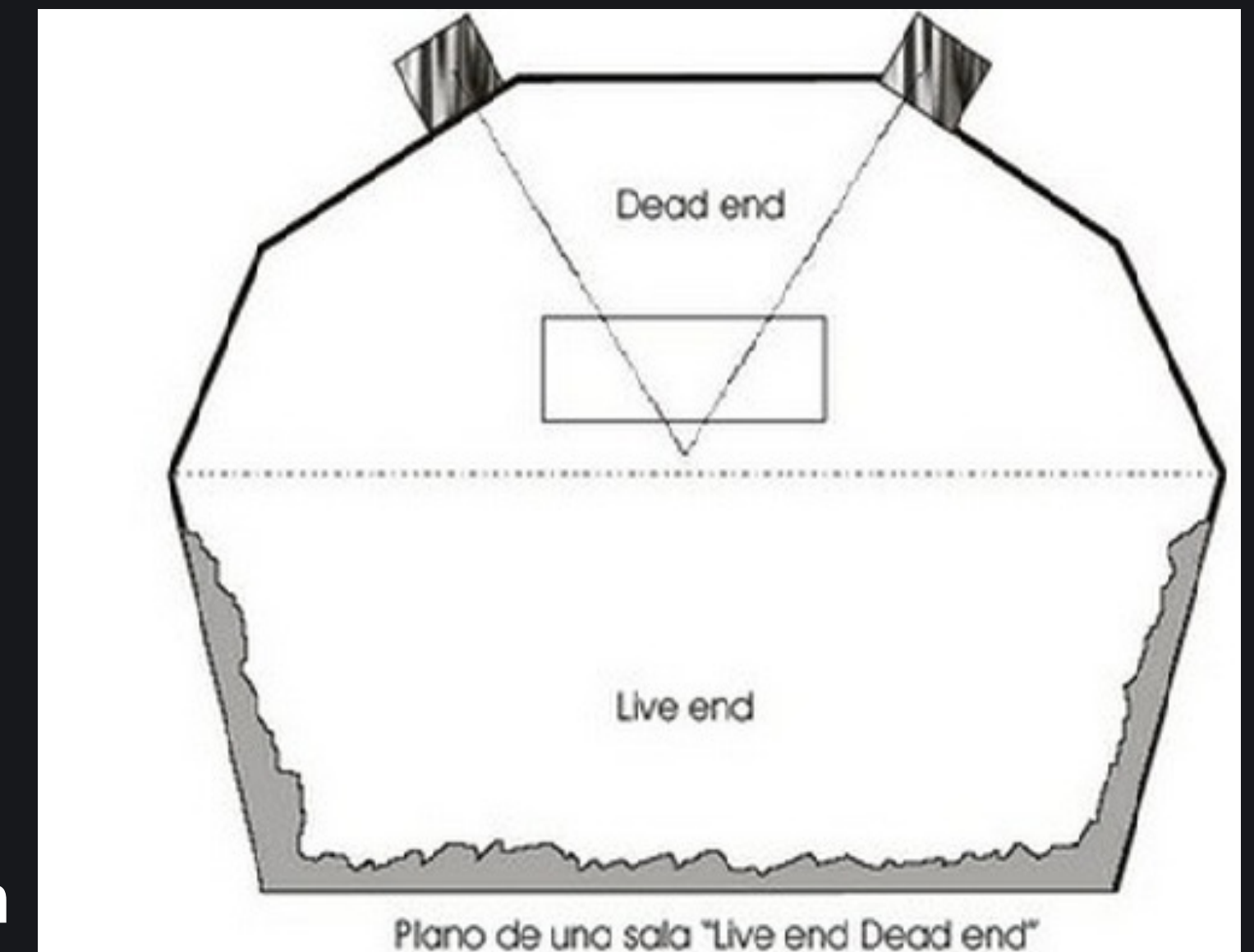
The psychoacoustic theory of LEDE is one of the most debated.
Critics introduce reflective panels (**Haas-Kickers**) that reflect the sound from the back of the room diagonally, an idea already considered by Hidley in the past.

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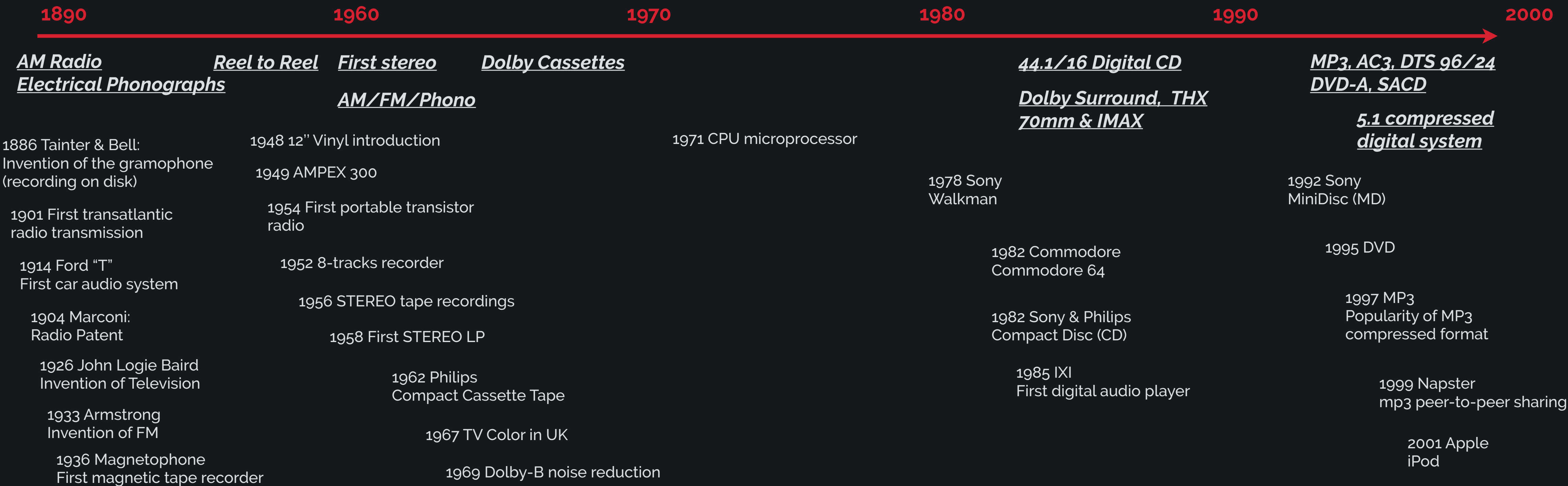
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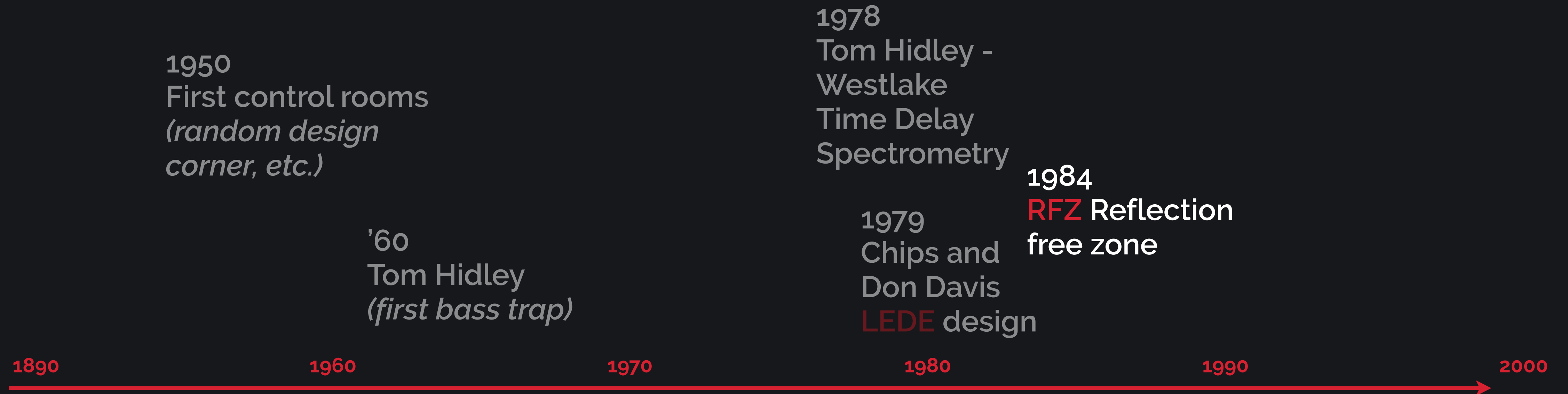
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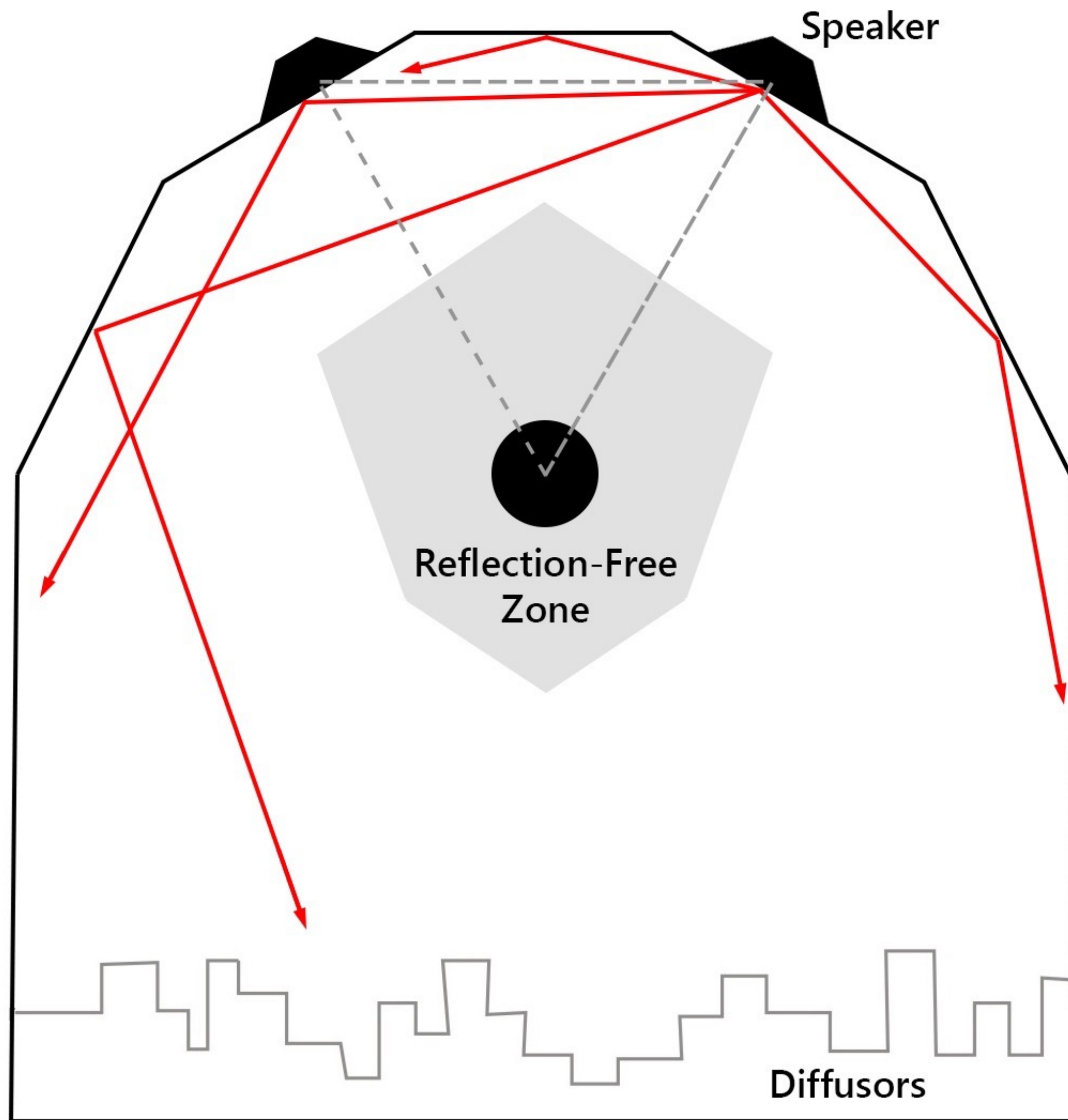
1984
RFZ Reflection
free zone





RFZ, Reflection Free Zone: starting from the LEDE principle, it is considered an extension of this. It is based on purely geometric principles: the idea is to modify the inclination of the ceiling and the front wall so as to form a zone without first reflections around the listening area.

The approach is valid for high frequencies down to 500 Hz, but the goal is to maintain a more stable and precise stereo image in the range between 500 ÷ 5000 Hz.



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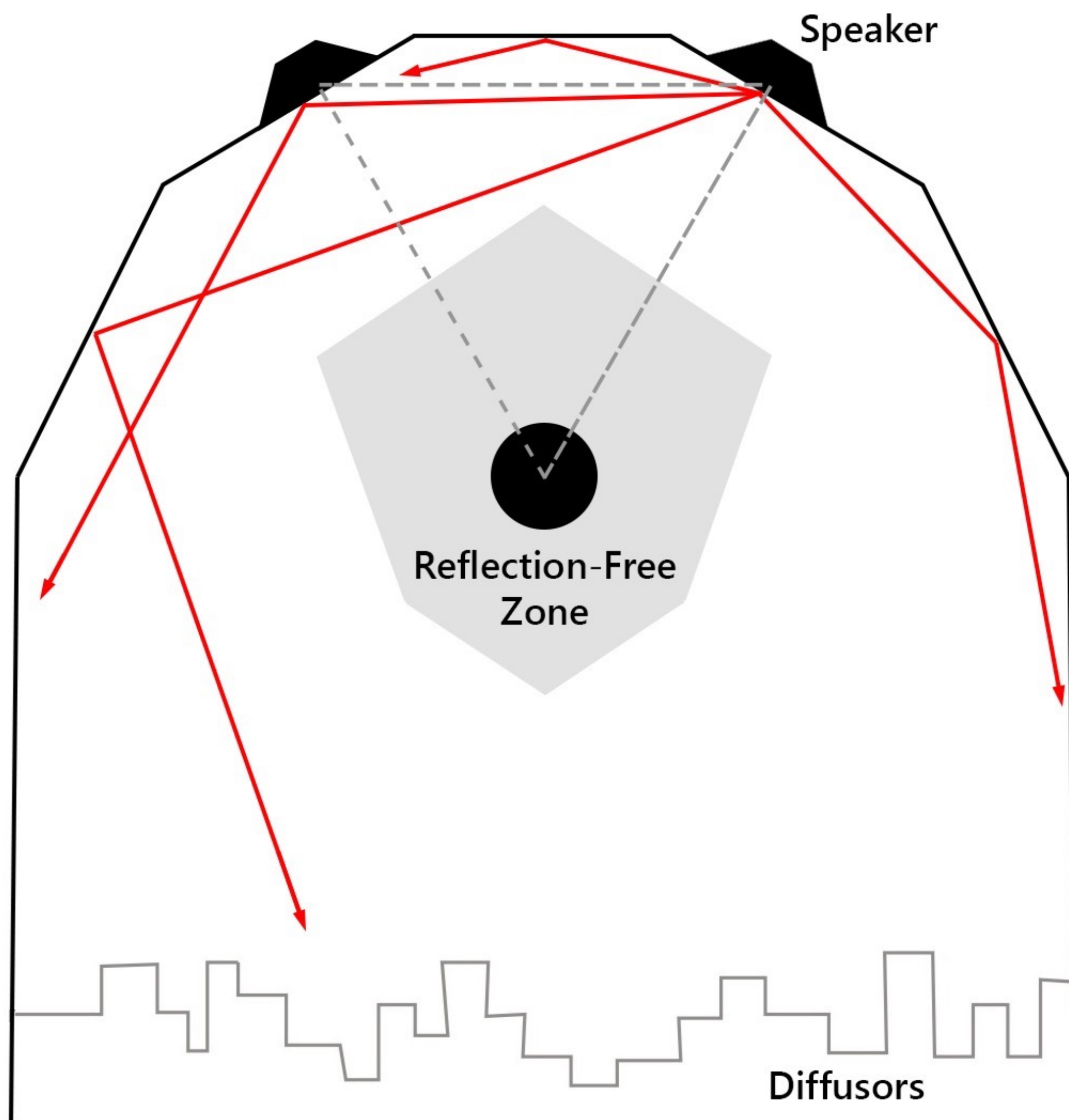
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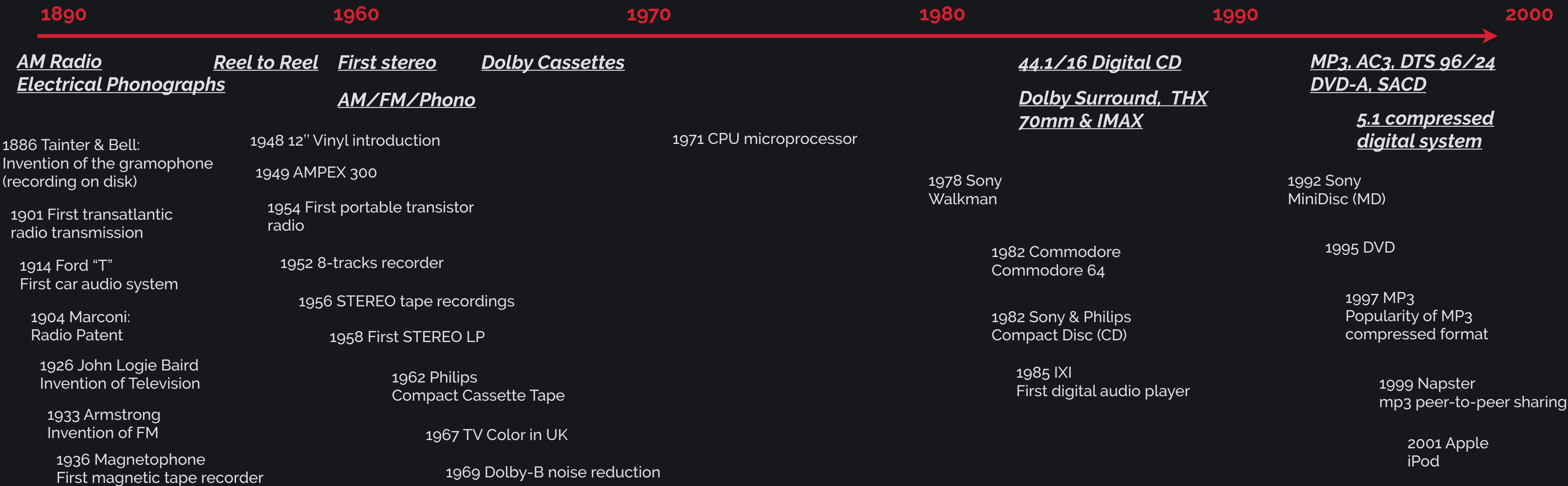
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Bob Walker (BBC)
Controlled Image
Design CID

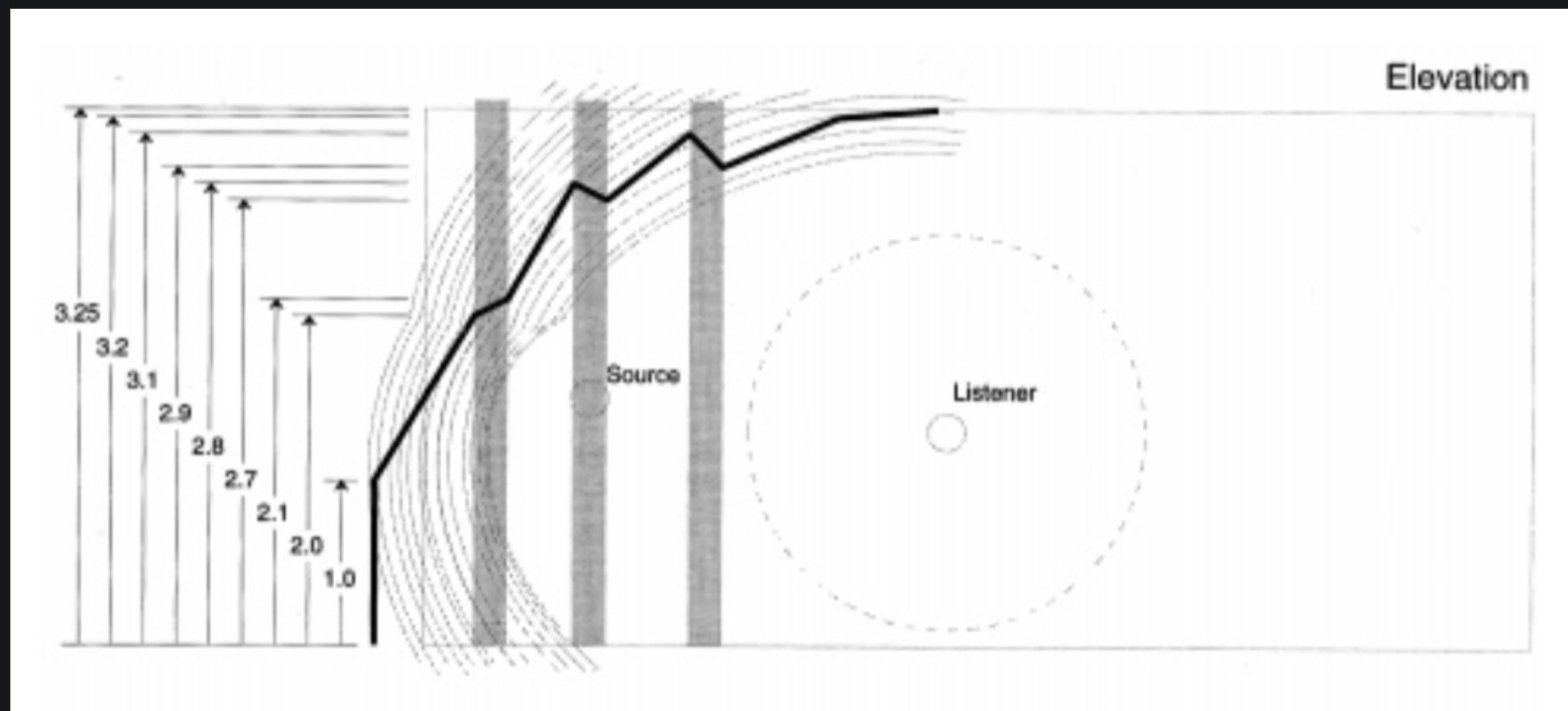




CID, Controlled Image Design: Developed by Bob Walker for the BBC (the European recording studio industry was far behind the American market in those years), is based on a principle similar to the RFZ, i.e. creating an area without strong early reflections near the listening point, but without introducing a large amount of absorption.

The reverberation time is a little longer ($0.3 \div 0.4$ s) but the first reflections should be $-15 \div -20$ dB lower than the direct sound.

This design had been used to study free-standing monitors, as the BBC required. Surely it is a design that favours listening similar to the "home" one, rather than the semi-anechoic one.



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Bob Walker (BBC)
Controlled Image
Design **CID**

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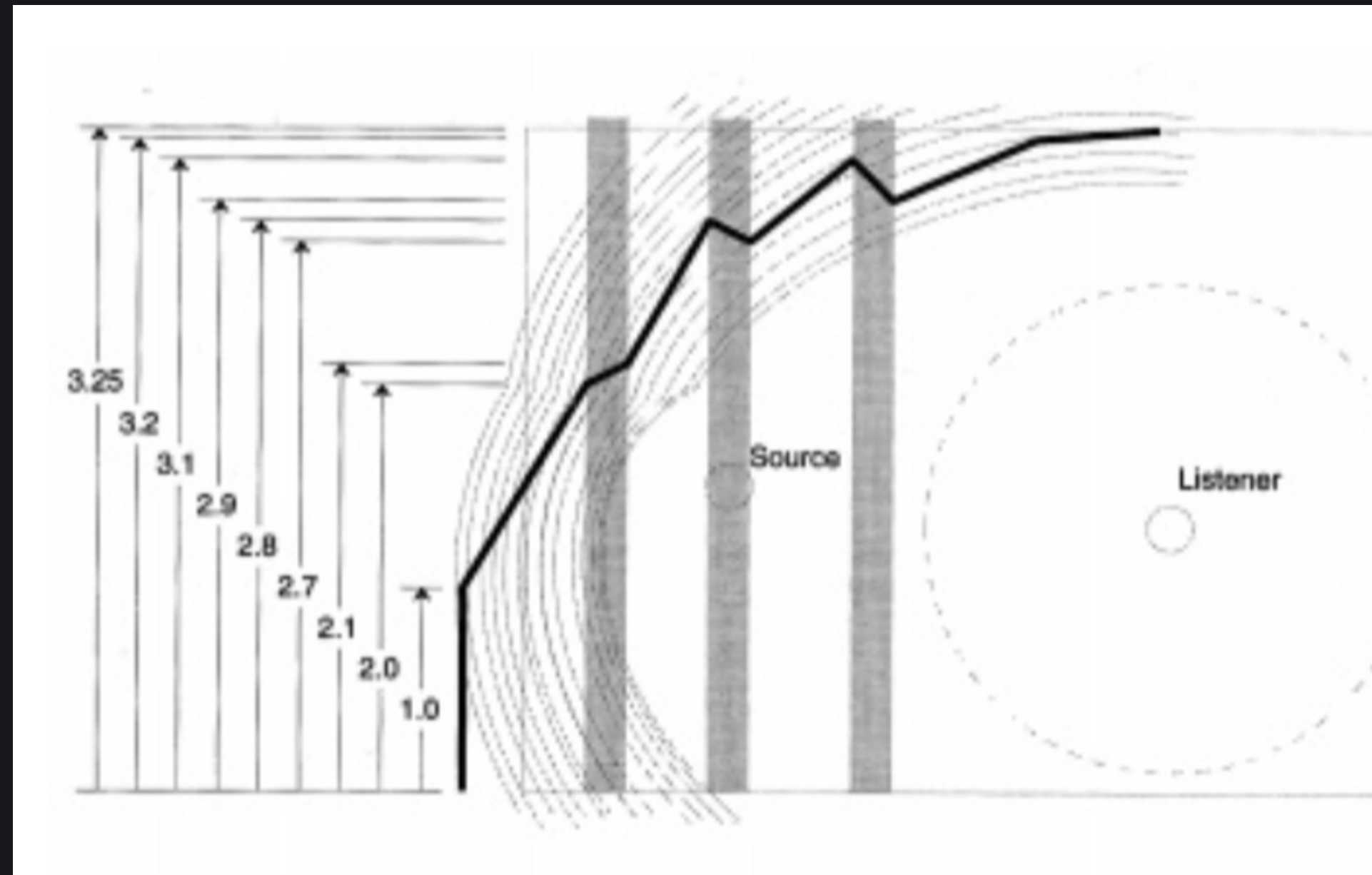
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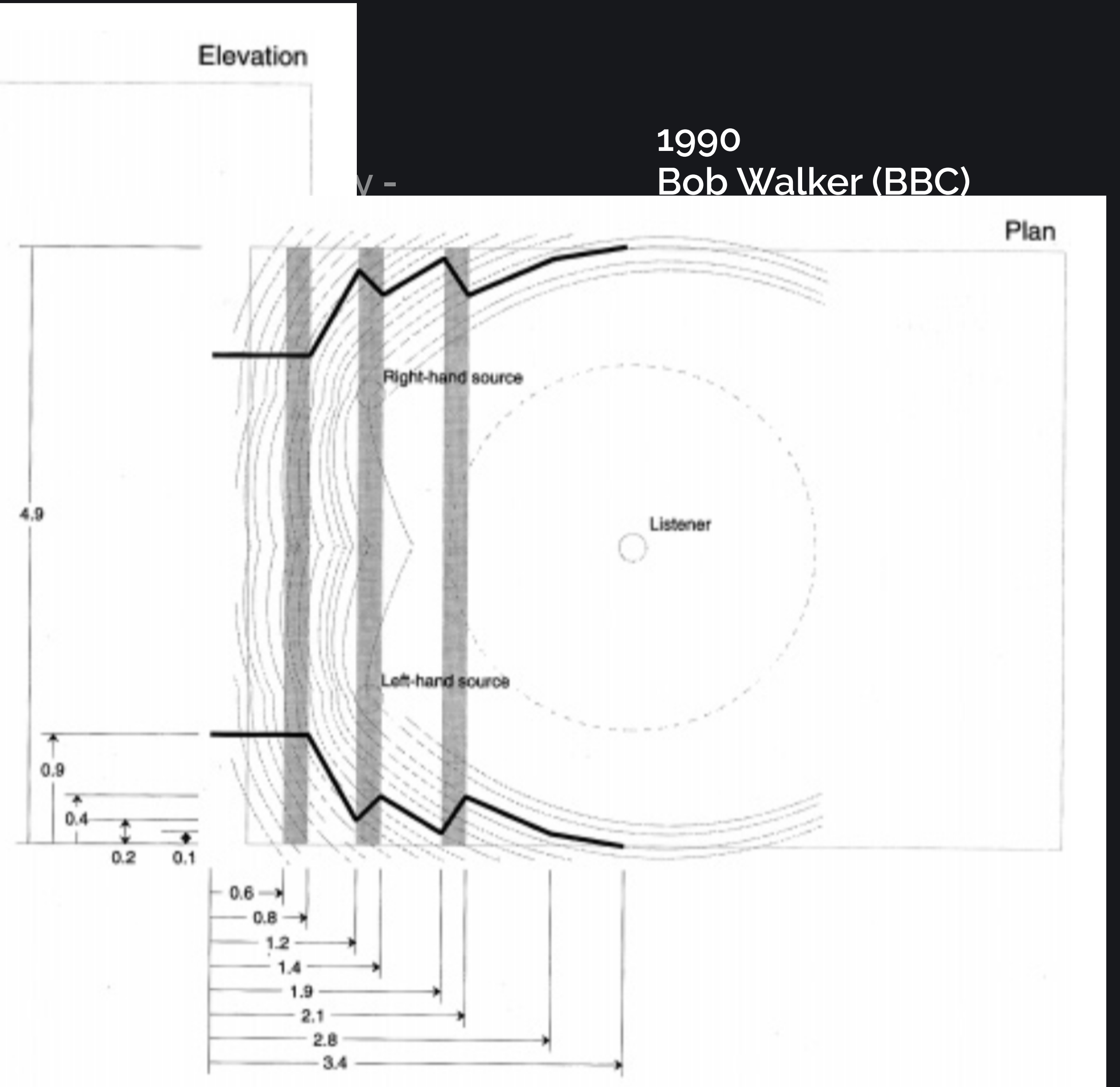
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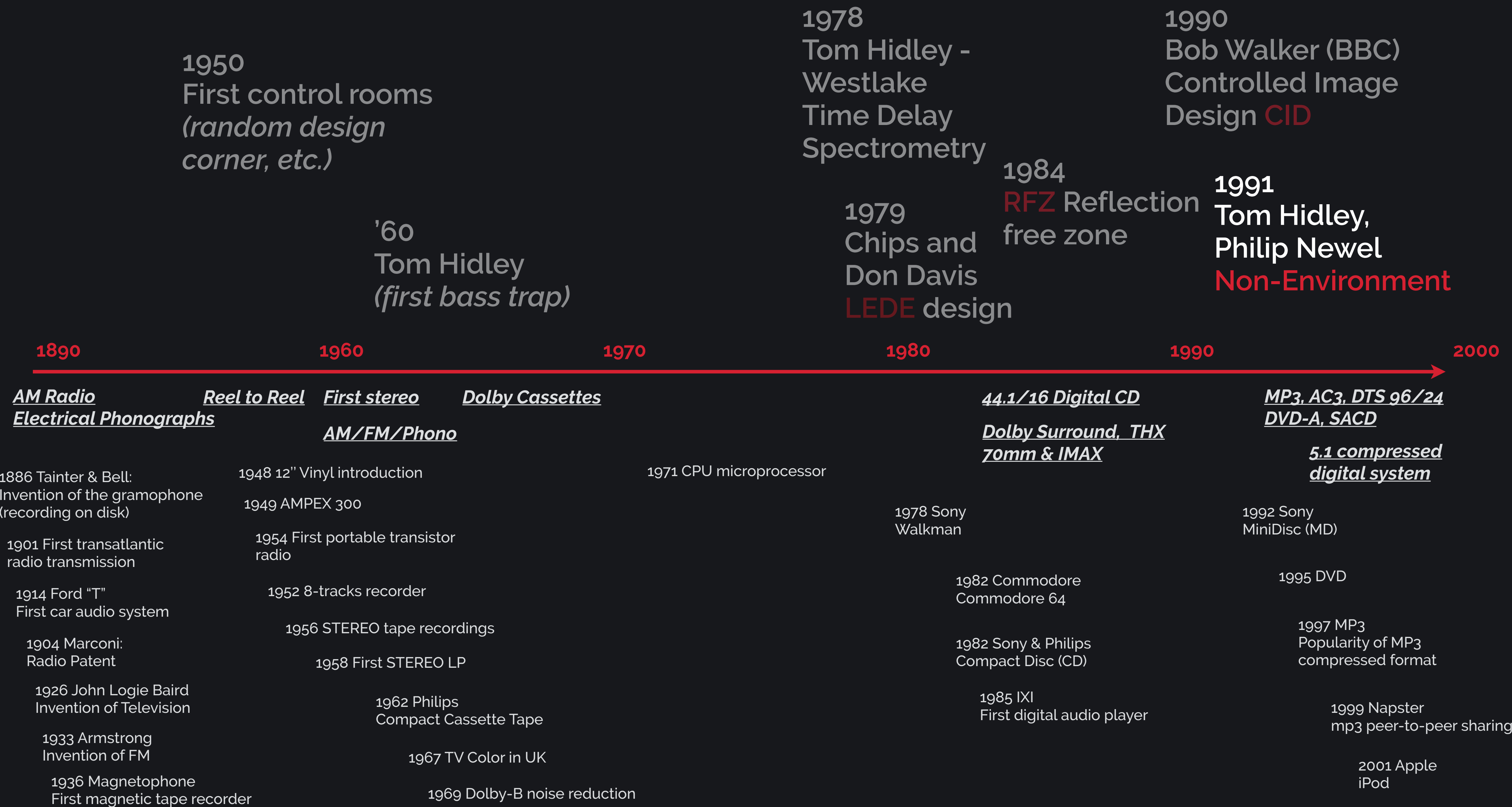
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Plan

c one.





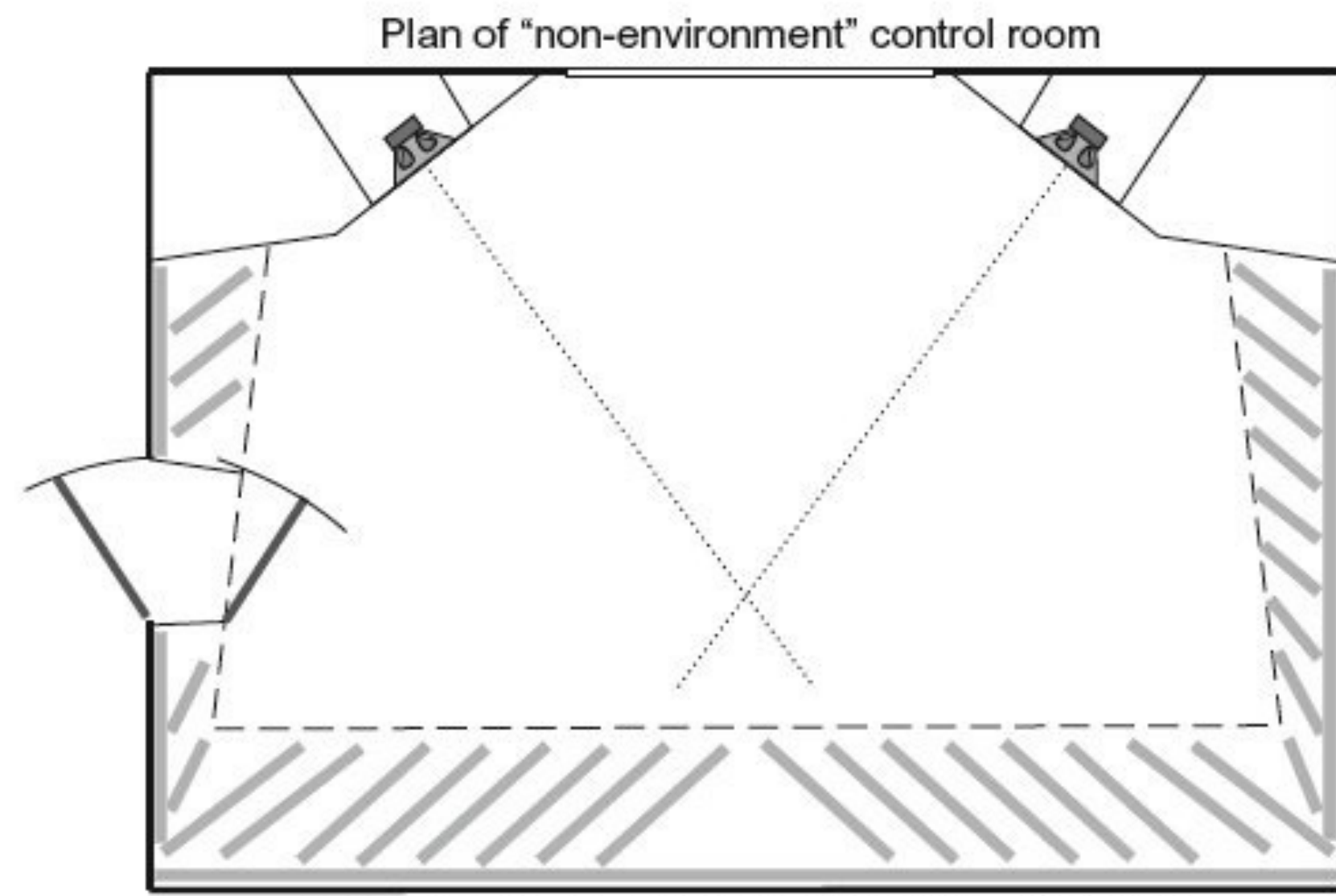
Non-Environment, still the state of the art.

It starts from the old principles of Tom Hidley, of the semi-anechoic chamber (listening to the roof), from the idea of having a drier reverberation time (0.2 s).

The idea is to have only 2 reflective walls: the front and the floor. The other walls are more absorbent possible, with broadband absorbers that go down very low (bass-trap baffles etc.).

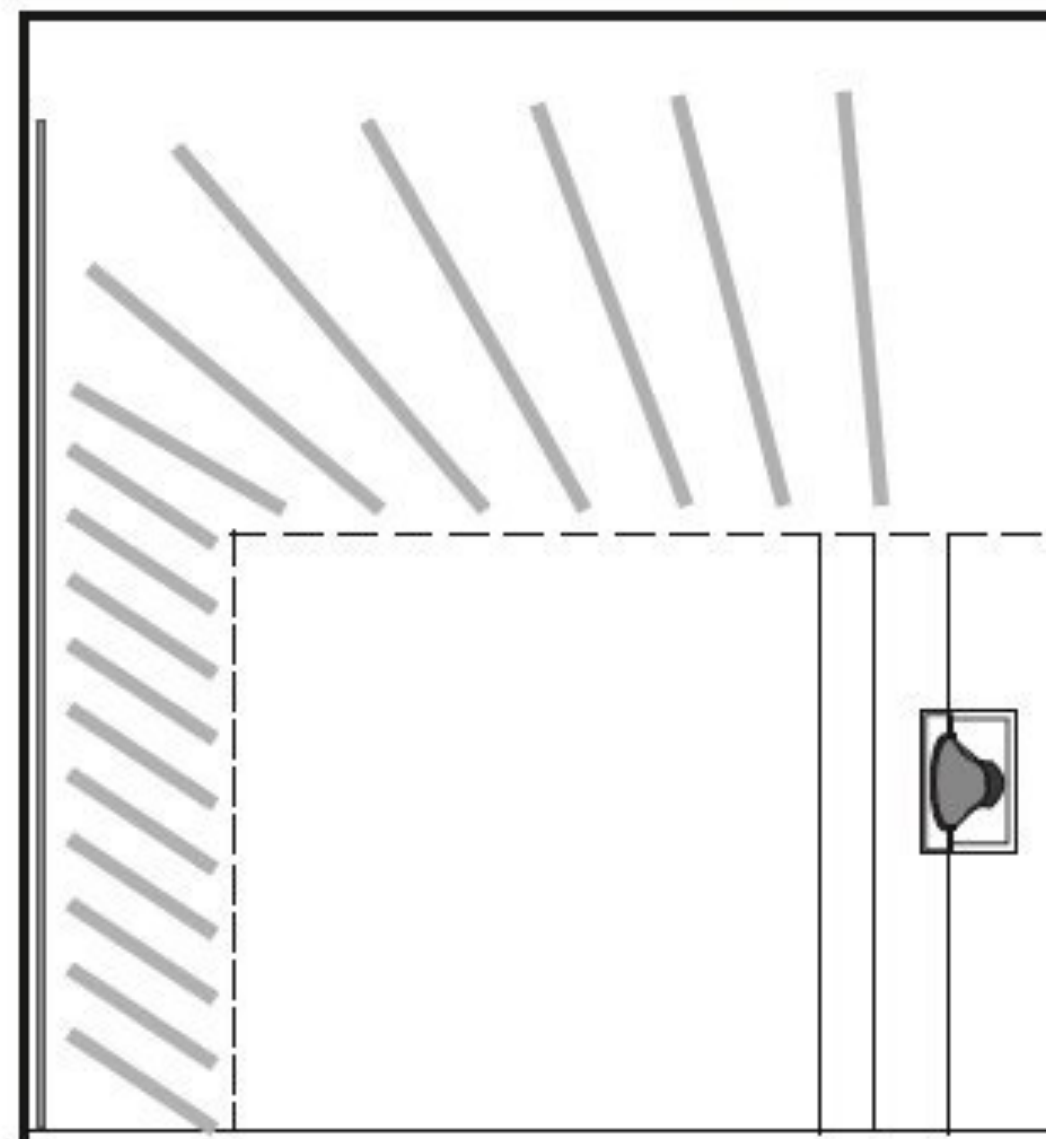
Nowadays it is normally used for medium-large size studios, thanks to Toyashima, medium-high frequency diffusion elements have been introduced on the back and on the side to give some reflections and a more natural feeling of listening.

This, with its variations, is considered the most effective technique.

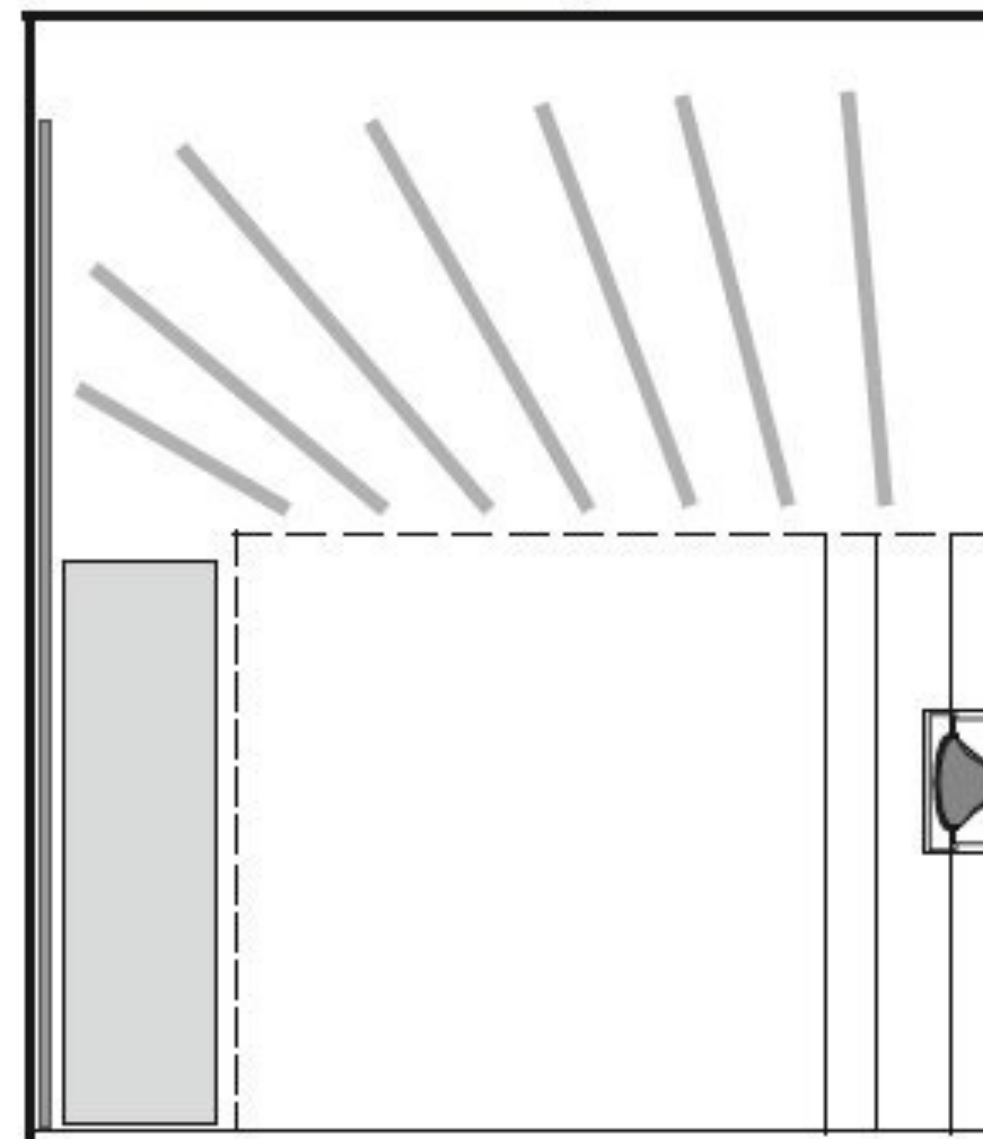


Shaded areas are wide-band absorber systems

Side elevations of "non-environment" control room showing:



(a) Horizontal rear absorbers



(b) Vertical rear absorbers

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Bob Walker (BBC)
Controlled Image
Design **CID**

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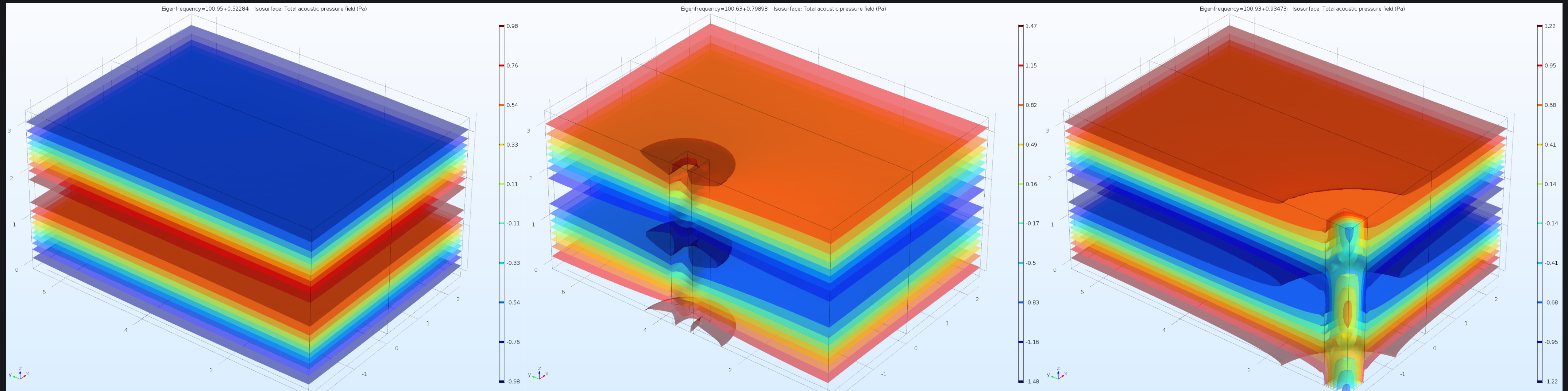
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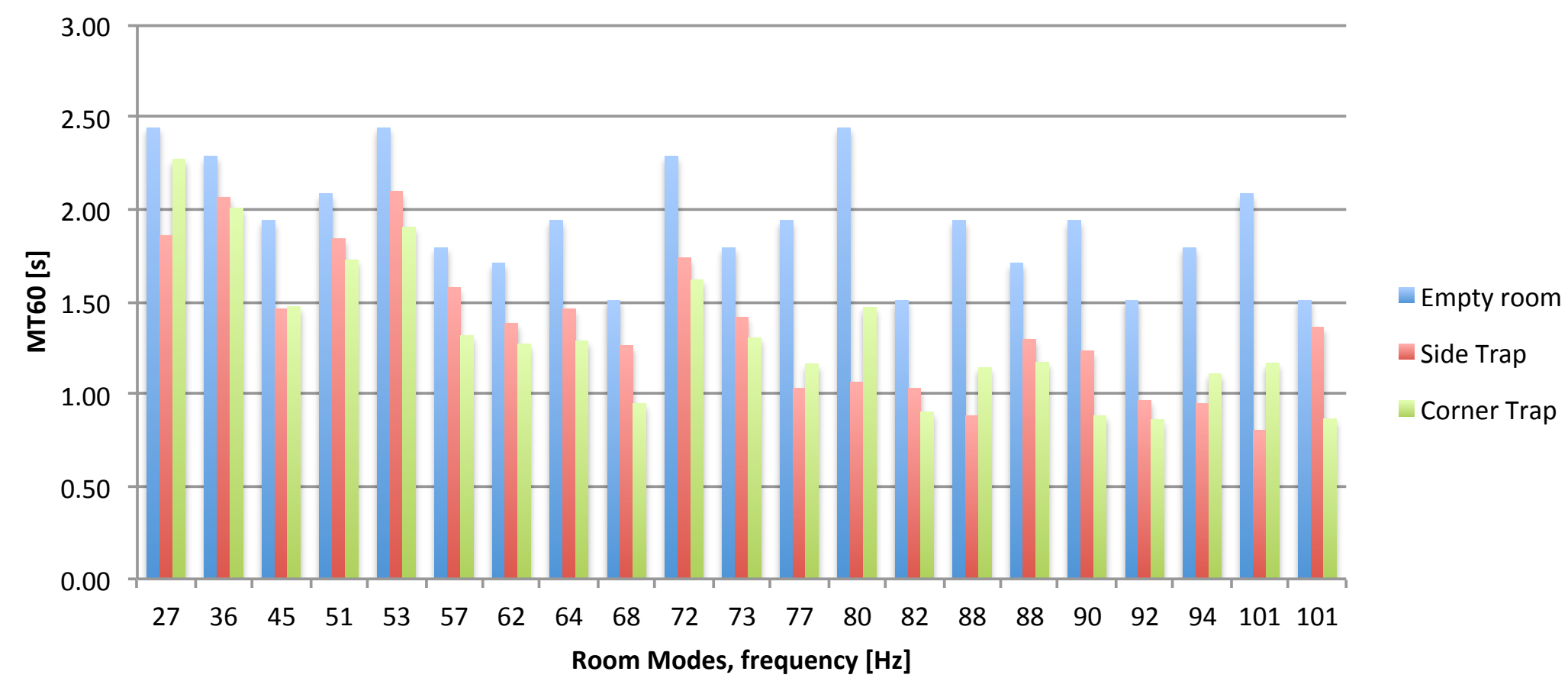
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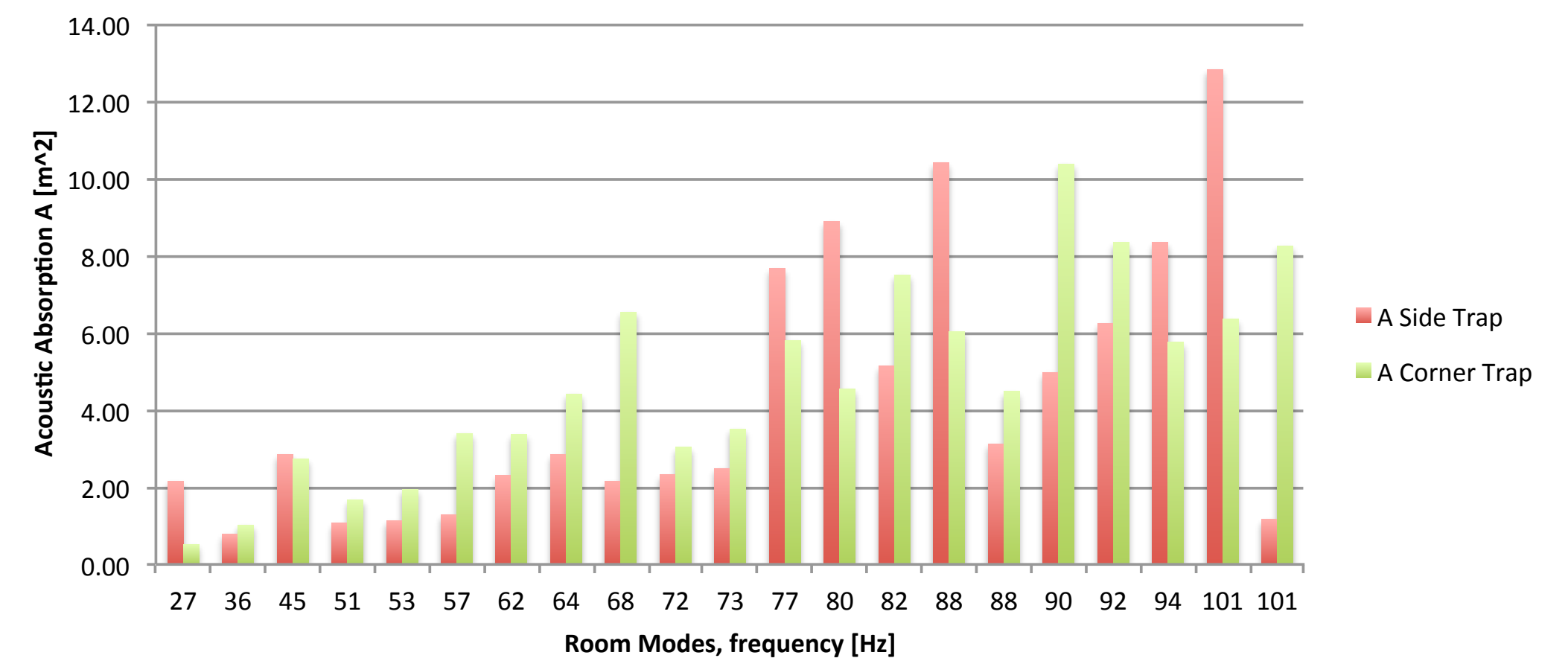
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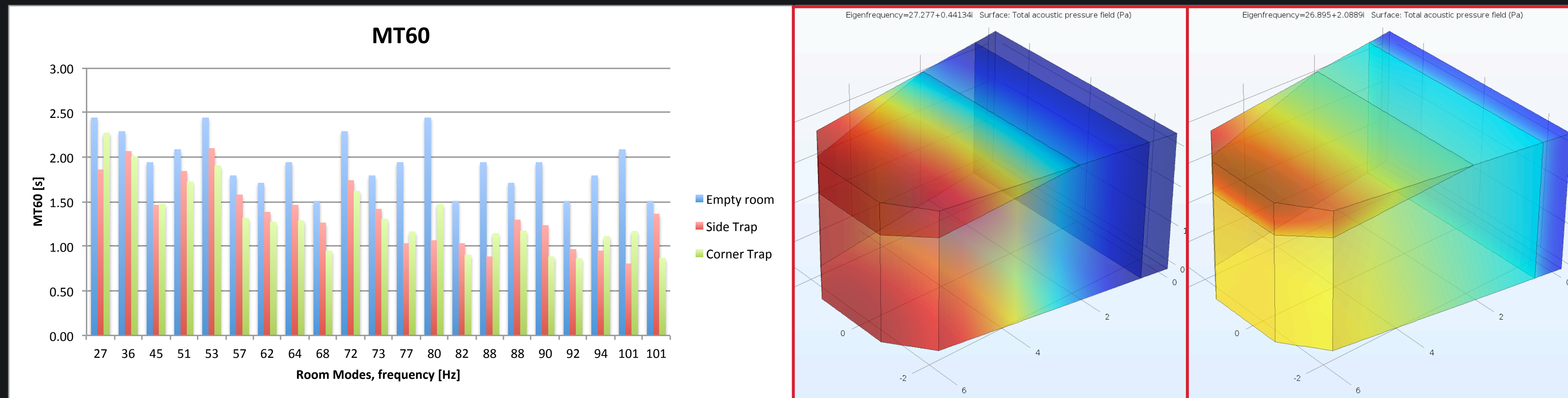
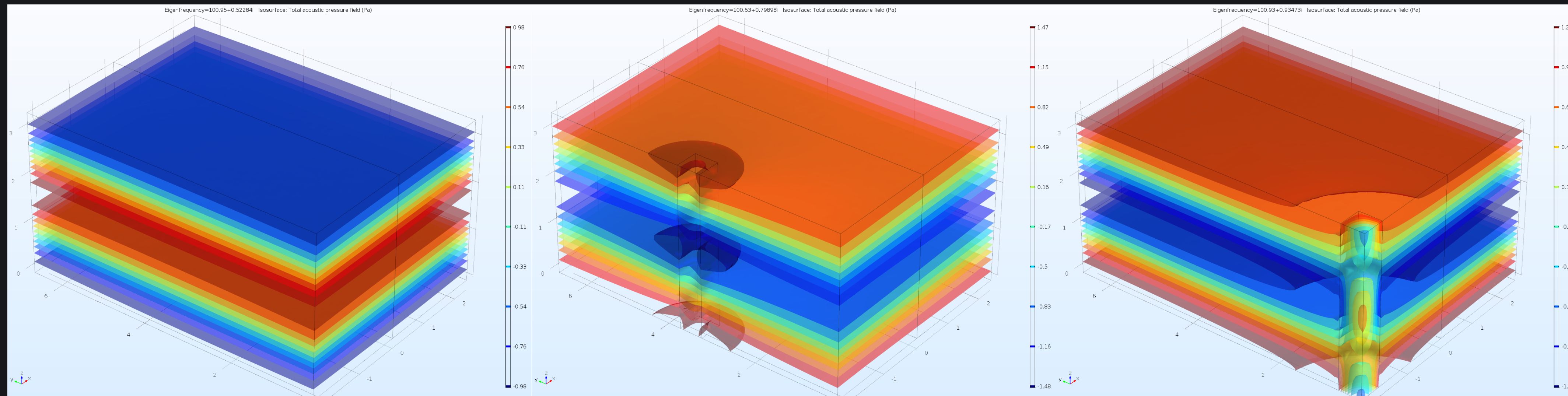


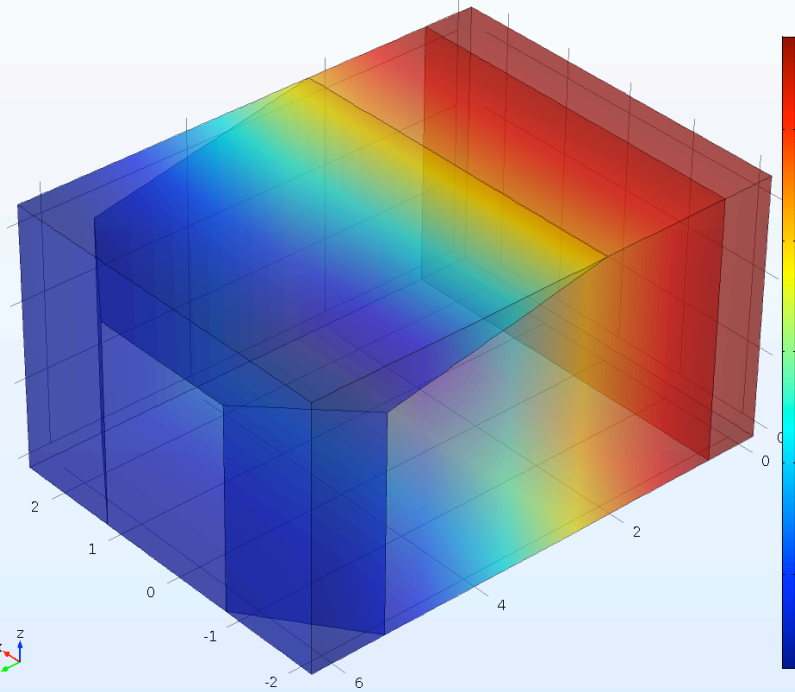
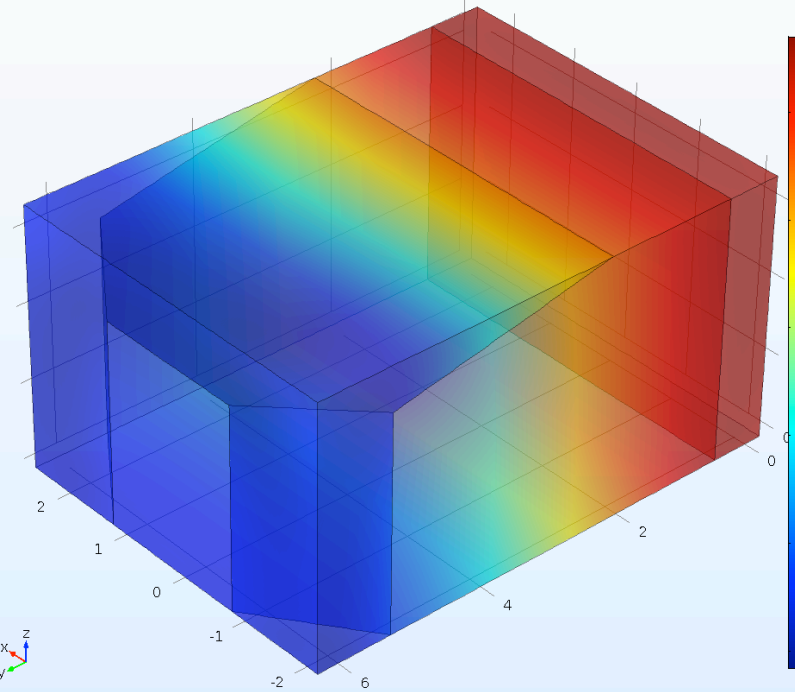
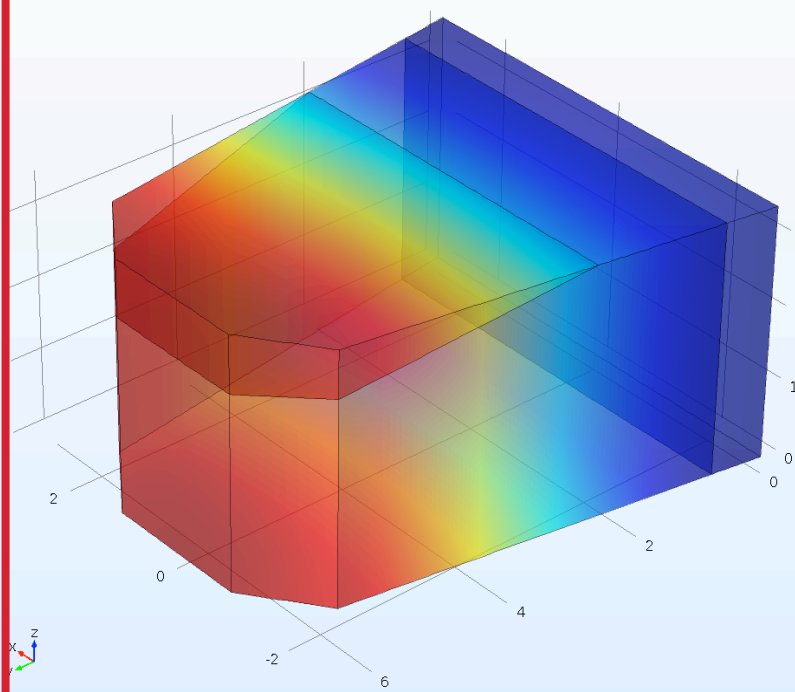
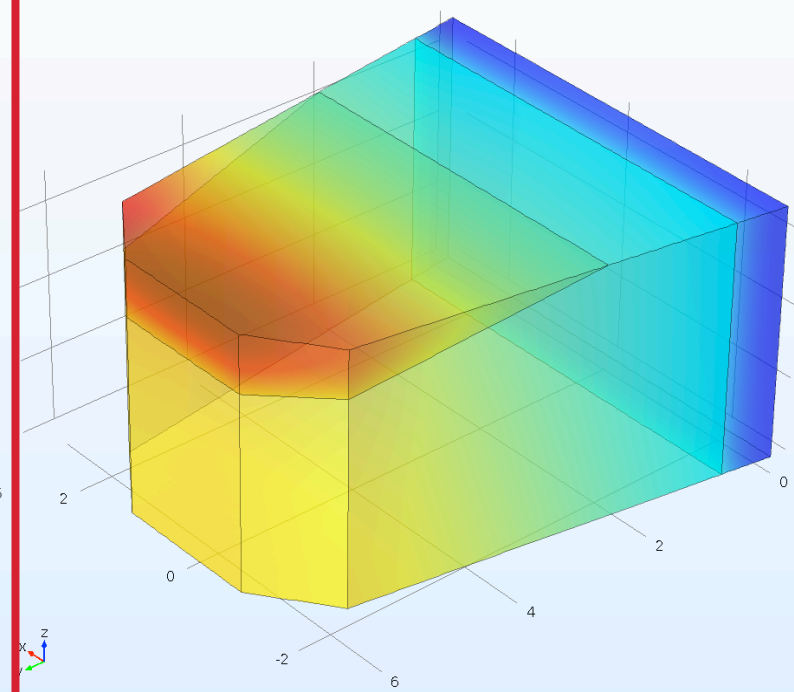
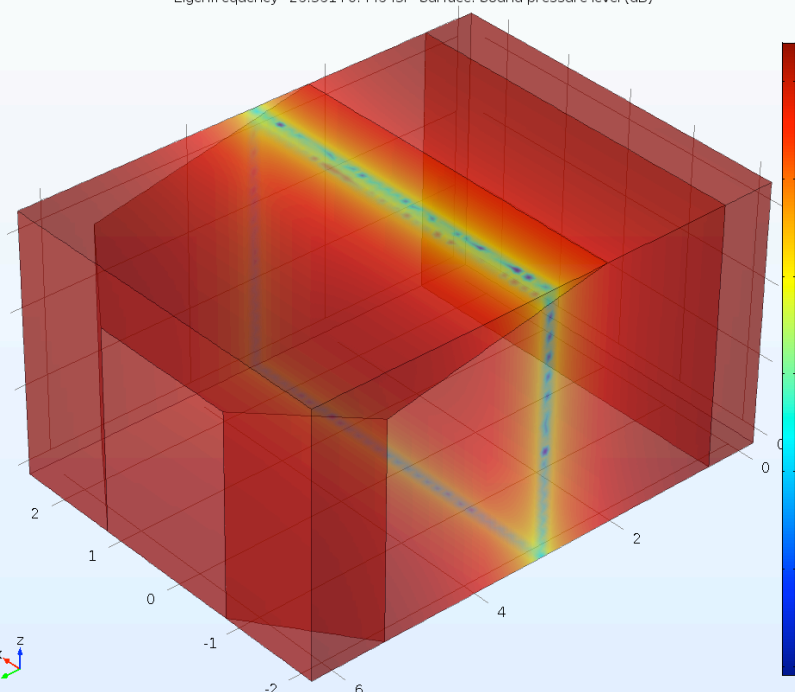
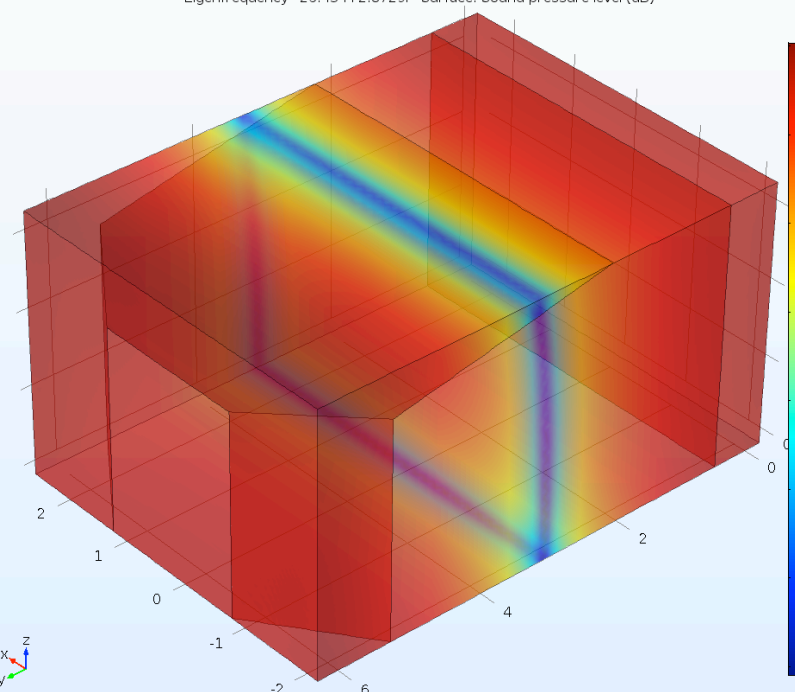
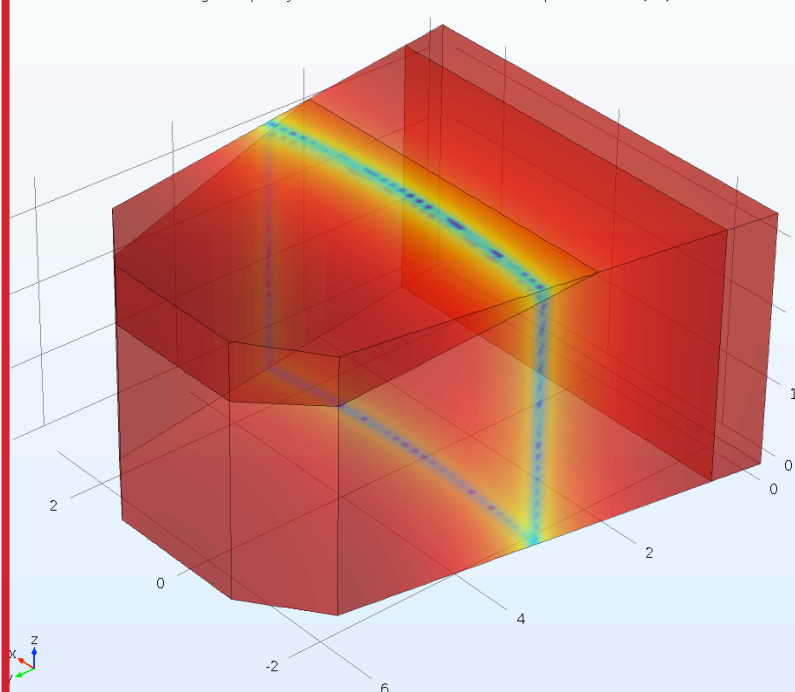
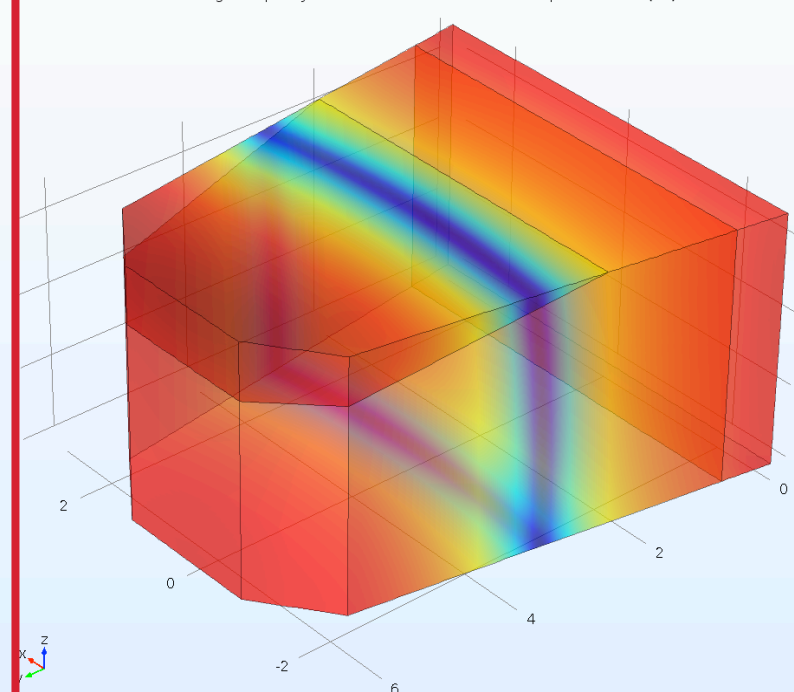
MT60



Bass trap Acoustic Absorption





1L mode	Louden		Louden "slanted"	
Mode	$f = 26.6 \text{ Hz}$	$f = 26.4 \text{ Hz}$	$f = 27.3 \text{ Hz}$	$f = 26.9 \text{ Hz}$
MT60	MT60 = 2.44 s	MT60 = 0.38 s	MT60 = 2.48 s	MT60 = 0.52 s
Acoustic Pressure	<p>Eigenfrequency=26.561+0.44645i Surface: Total acoustic pressure field (Pa)</p> 	<p>Eigenfrequency=26.434+2.8729i Surface: Total acoustic pressure field (Pa)</p> 	<p>Eigenfrequency=27.277+0.44134i Surface: Total acoustic pressure field (Pa)</p> 	<p>Eigenfrequency=26.895+2.0889i Surface: Total acoustic pressure field (Pa)</p> 
SPL	<p>Eigenfrequency=26.561+0.44645i Surface: Sound pressure level (dB)</p> 	<p>Eigenfrequency=26.434+2.8729i Surface: Sound pressure level (dB)</p> 	<p>Eigenfrequency=27.277+0.44134i Surface: Sound pressure level (dB)</p> 	<p>Eigenfrequency=26.895+2.0889i Surface: Sound pressure level (dB)</p> 

1H mode	Louden		Louden "slanted"	
Mode	$f = 50.5 \text{ Hz}$	$f = 50.1 \text{ Hz}$	$f = 50.5 \text{ Hz}$	$f = 49.6 \text{ Hz}$
MT60	MT60 = 2.09 s	MT60 = 0.20 s	MT60 = 2.10 s	MT60 = 0.16 s
Acoustic Pressure				

Recording studios classification



Pro studio according to wikipedia

The professional recording studio is usually the largest of the three types. It almost always features recording rooms and control rooms as well as the best analog and digital technologies.

Performs third party recordings of material that almost always ends up in the music industry.



Project studio according to wikipedia

Often the project studio is born to complete the registration of a project by an artist or a band. At the same time or afterwards also carries out third party recordings of both demos and records for the music industry.

It is usually equipped with at least one recording room and a control room and is well supplied both with analog and digital equipment.



Home studio according to wikipedia

The home studio is the home version of the project studio. Housed in the home, it usually has the sole purpose of producing demos or records pre-productions. With the decrease in prices of audio technology is increasingly used, but you must have a good knowledge of the material and good equipment.

It rarely has expensive devices and relies mostly on digital technologies.



Spontaneous doubts about classification and nature of the different types of recording studios

- A. if you do not record anymore in your studio, can we still talk about “recording studio”?
music production studio is better
- B. if a top artist/producer has a home studio with highest level technology, can we call it “home studio”?
the word "home" is misleading
- C. is a DJ studio a home or project studio?
- D. if you are able to get to the final result with the home studio, is it therefore a project studio?
- E. what is the real difference now between the project studio and the top studio?

Project Studio

Top Studio

nothing?
controller?
small analogue consoles

Console

Analog Console
(SSL, NEVE, Audient)

digital (DJ and small studios)
analog (with summing mixers or
small analog consoles)

Sum

Analog sum (console)
or other summing mixers

(generally) near / mid field
sometimes small big monitors (DJs),
often not flush mounted

Monitors

Big monitor (flush mounted)
+ near / mid field

many preamps, 500 series lunchbox,
compressors, equalizers,
someone has some mastering outboard

Outboard

Some preamps (most are on the
console) compressors, equalisers

few but good, if necessary

Microphones

great equipment to meet any need

Costs?! €\$£¥

Audio equipment type

analogue console	analogue console	analogue or digital console	analogue console only top studios digital mixers, controllers	analogue console only top studios digital mixers, controllers rediscovery of the modular analogue outboard, [analog 500 series (API lunchbox)]	analogue console only top studios digital mixers, controllers + analogue outboard (pre/sum/eq/comp...)
tape recorder	tape recorder + digital recorder	digital recorder	plugin and digital recorder	plugin and digital recorder ----- appearance of may mastering studios	plugin and digital recorder ----- DJ producers with only mac and audio interface

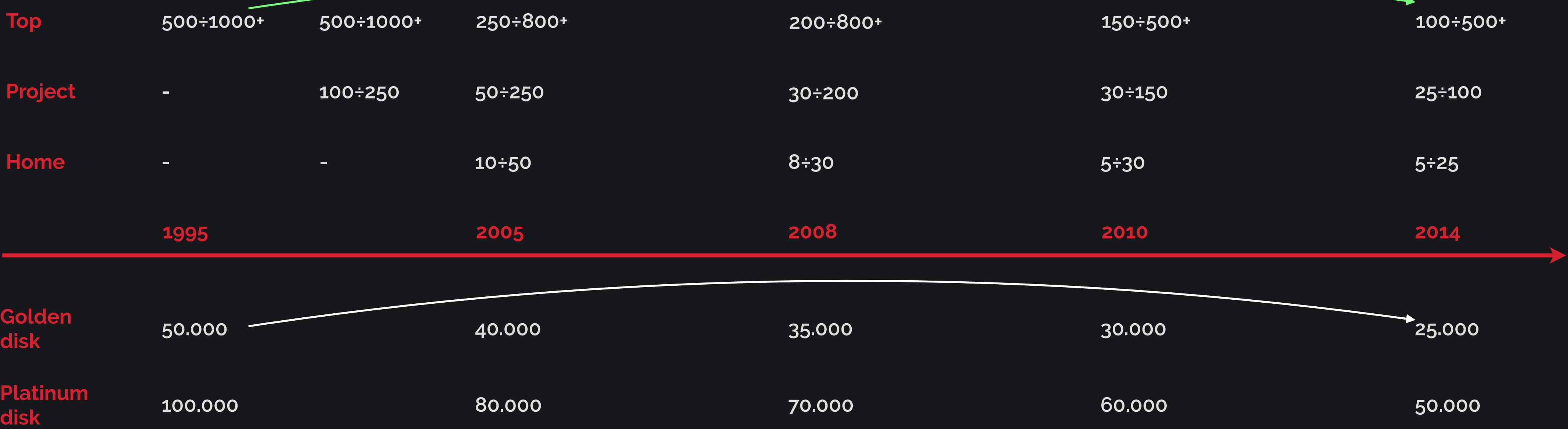
Audio equipment costs K€

Top	500÷1000+	500÷1000+	250÷800+	200÷800+	150÷500+	100÷500+
Project	-	100÷250	50÷250	30÷200	30÷150	25÷100
Home	-	-	10÷50	8÷30	5÷30	5÷25
	1995		2005	2008	2010	2014
Golden disk	50.000		40.000	35.000	30.000	25.000
Platinum disk	100.000		80.000	70.000	60.000	50.000

Audio equipment type

analogue console	analogue console	analogue or digital console	analogue console only top studios digital mixers, controllers	analogue console only top studios digital mixers, controllers rediscovery of the modular analogue outboard, [analog 500 series (API lunchbox)]	analogue console only top studios digital mixers, controllers + analogue outboard (pre/sum/eq/comp...)
tape recorder	tape recorder + digital recorder	digital recorder	plugin and digital recorder	plugin and digital recorder ----- appearance of may mastering studios	plugin and digital recorder ----- DJ producers with only mac and audio interface

Audio equipment costs K€



Studio construction costs K€

Top	200÷1000+	200÷1000+	200÷1000+	200÷1000+	200÷1000+	200÷1000+
Project	-	25÷200	25÷200	25÷200	20÷150	20÷100
Home	-	-	8÷25	8÷25	8÷20	8÷20

Audio equipment costs K€

Top	500÷1000+	500÷1000+	250÷800+	200÷800+	150÷500+	100÷500+
Project	-	100÷250	50÷250	30÷200	30÷150	25÷100
Home	-	-	10÷50	8÷30	5÷30	5÷25

1995
2005
2008
2010
2014

Golden disk	50.000	40.000	35.000	30.000	25.000
Platinum disk	100.000	80.000	70.000	60.000	50.000

Studio construction costs K€

Top	200÷1000+	200÷1000+	200÷1000+	200÷1000+	200÷1000+	200÷1000+
Project	-	25÷200	25÷200	25÷200	20÷150	20÷100
Home	-	-	8÷25	8÷25	8÷20	8÷20

Audio equipment costs K€

Top	500÷1000+	500÷1000+	250÷800+	200÷800+	150÷500+	100÷500+
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1995

2005

2008

2010

2014

Daily income €

Top	600÷2000	600÷1500	600÷1500	500÷1000	400÷800
Project	-	300÷600	350÷600	300÷500	250÷400
Home	-	-	150÷300	120÷300	100÷250

Studio construction costs K€

Top	200÷1000+	200÷1000+	200÷1000+	200÷1000+	200÷1000+	200÷1000+	200÷1000+
Project	-	25÷200	25÷200	25÷200	20÷150	20÷100	
Home	-	-	8÷25	8÷25	8÷20	8÷20	

Audio equipment costs K€

Top	500÷1000+	500÷1000+	250÷800+	200÷800+	150÷500+	100÷500+
Project	-	100÷250	50÷250	30÷200	30÷150	25÷100
Home	-	-	10÷50	8÷30	5÷30	5÷25

1995

2005

2008

2010

2014

Daily income €

Top	600÷2000	600÷1500	600÷1500	500÷1000	400÷800
Project	-	300÷600	350÷600	300÷500	250÷400
Home	-	-	150÷300	120÷300	100÷250

Case studies

Ronny Aglietti

Monte San Savino — AR





a working studio with a few musicians, small ensembles, to record individual instruments and prepare productions, up to the final mix for lo-mid productions



500 series, summing mixer, preamplifiers, analog outboard (SSL, API, NEVE, IGS, Warm audio), controller, audio system with (auto)calibration

Bagnoli bros. studio

Castelnovo ne' Monti — RE





a working studio with a few musicians, small ensembles, to record individual instruments and prepare productions, up to the final mix for lo-mid productions



500 series, sommatori, preamplificatori, outboard analogico (SSL, API, NEVE, IGS, Warm audio), controller midi, casse con autocalibrazione

Federico de Robertis

Lucca





a working studio with a few musicians,
small ensembles, to record individual
instruments and prepare productions, up
to the final mix for lo-mid productions
Dj-ing



masterkeyboards, rhodes and piano,
acoustic instruments, summing mixer,
preamplifiers, analogue outboards, midi
controllers, systems and high-level audio
interfaces 2.1 and 5.1

Vinai

Brescia





a place to work essentially in two, no recordings, no analogue, "in the box" mix



computer, midi keyboard for virtual instruments, audio interface and high-level studio monitors

Damian Lazarus

Vicchio – FI





a place to work in small ensembles,
produce, play and arrange; isobooth to
record voices and individual instruments;
"homy" aesthetics; "in the box" mix.



computers, many keyboards, analogue
and digital effects, electric and electronic
acoustic instruments, audio interface and
high-level listening

SonicLab, Maxx Monopoli

Milan





Electronic music production studio with
several rooms and an isobooth to record
voices and individual instruments.
Big monitors and small analog console.



Nice audio equipment and good listening
systems.

Magnitudo Studio

Ghezzano – PI





a place to work with small and medium ensembles, produce, play and arrange; recording room to record small bands and drums.



good assortment of electric, electronic and acoustic instruments, analogue outboard and vintage equipment. Small Genelec big monitors and small analogue mixer.

Kalimba Studio

Monselice – PD





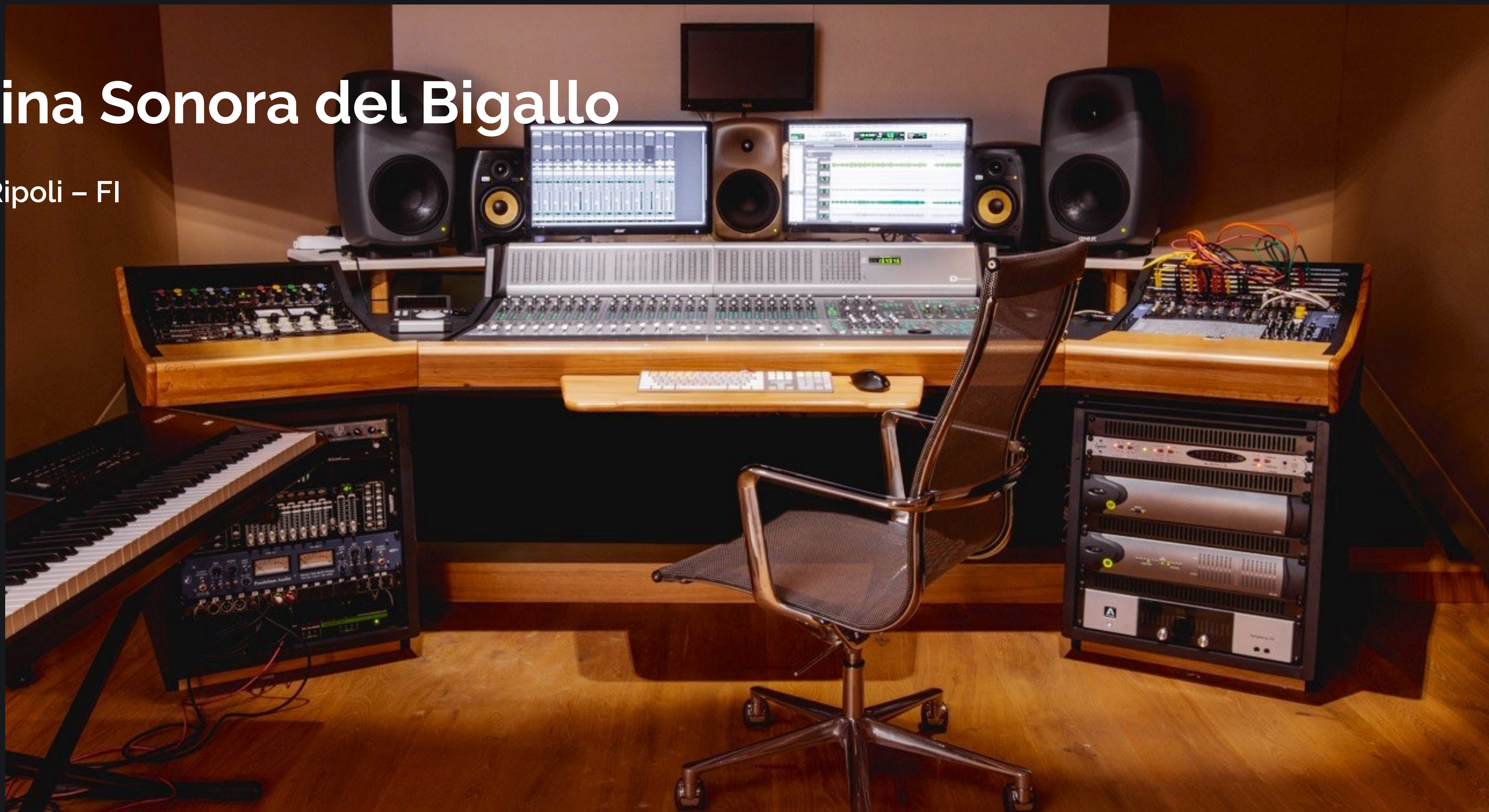
a place to work with small and medium ensembles, produce, play and arrange; isobooth to record voices and individual instruments; recording room, "homy" aesthetics; analogical mix.



large assortment of electric and electronic acoustic instruments, analogue outboard and vintage equipment.

Officina Sonora del Bigallo

Bagno a Ripoli – FI





a space to work with small, medium and large ensembles, produce, play and arrange; great recording room, iso booth.



good assortment of electric, electronic and acoustic instruments, analogue outboard and vintage equipment. 5.1 Genelec system and ICON controller.

Daniele Marzi Studio

Riccione





Orchestral room with piano, suitable for jazz with 4 iso booth, plenty of brightness in the hall, great visibility among the musicians.



Project studio control room, no analog console, no big monitor, good assortment of electric, electronic and acoustic instruments, analogue outboard and vintage equipment.

House of Glass Gianni Bini

Viareggio





Top studio without compromise:
analog console, big monitor, highest level
outboard, high room with piano and two
iso-booth.



5.1 system, ADAM big monitor, excellent
range of microphones, analogue outboard
and instruments.

The Garage Studio (ex Fabrizio Simoncioni)

Civitella val di Chiana





Top studio without compromise, only mix room: analog console, big monitor, outboard of the highest level. Two small accessory shooting rooms.



Large assortment of analogue outboard and vintage equipment. Big Genelec monitors.

Mulinetti Alberto Parodi

Genova





Top studio made in a home environment, so with some structural compromise (height etc.), no analog console; 2 shooting rooms + iso-booth.



5.1 / 7.1 system, ATC big monitor, excellent range of microphones, analog outboard and vintage equipment combined with the latest generation solutions like the Genelec 8351.

D:POT recording arts Fabrizio Simoncioni

Prato





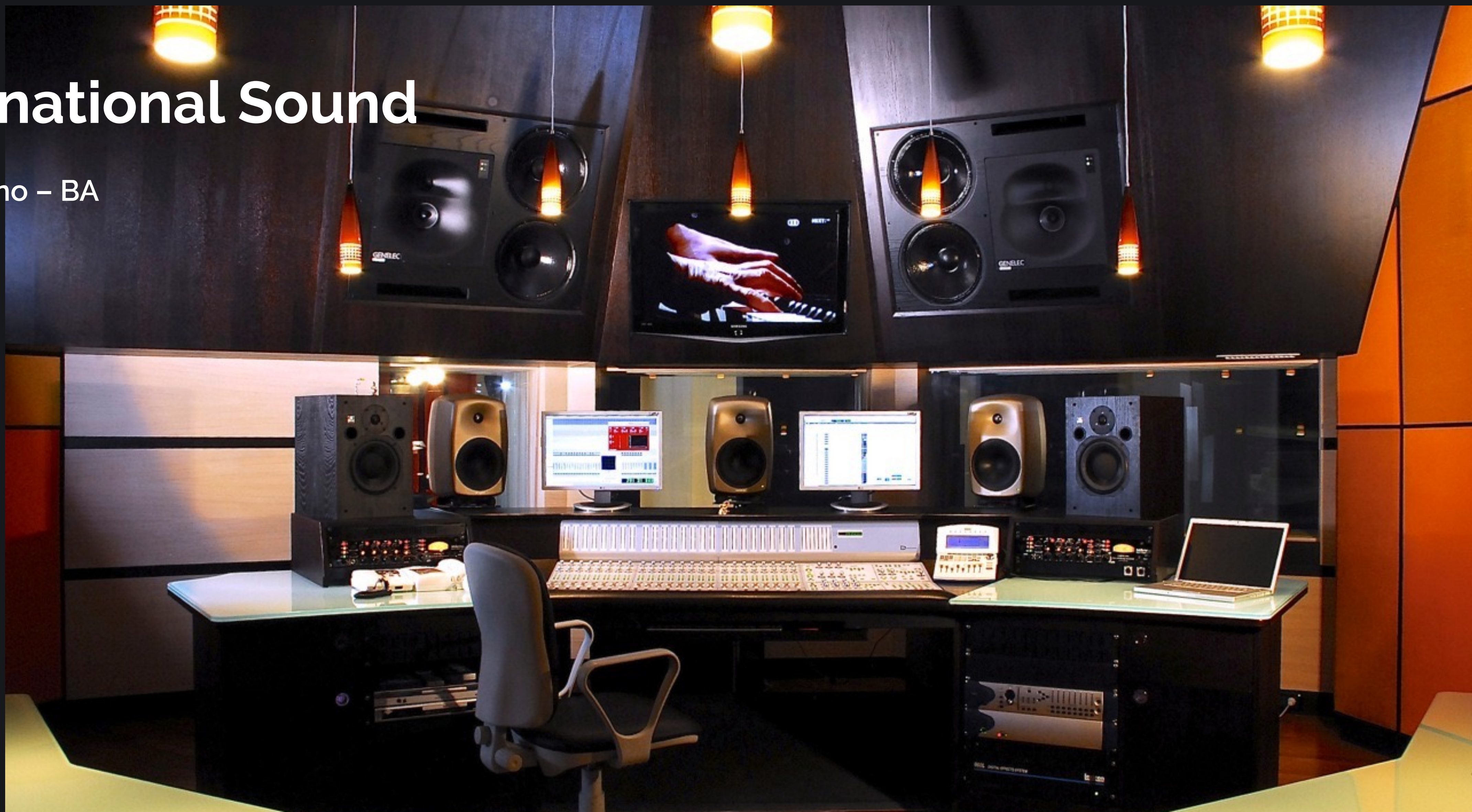
Top studio without compromise: analog console, big monitor, highest level outboard, live room with piano and a dryer recording room B.



Large assortment of analogue outboard and vintage equipment combined with the latest generation solutions like the Genelec 8351.

International Sound

Conversano – BA





Orchestral recording room for up to 80 musicians, with piano; iso booth to record voices and individual instruments.



No analog console, ICON controller, Genelec big monitor, 5.1 listening system.

Sudestudio

Guagnano – LE





Orchestral recording room for up to 80 musicians, B-room for dry recording (voices and single instruments), Amek analogue mixer, Dynaudio big monitor.



Large assortment of electric, electronic and acoustic instruments, analogue outboard and vintage equipment.

Conclusions

Conclusions:

- A. It is difficult to establish the differences between different types of studio (top/project/home);
- B. the general trend is “rooms getting smaller”;
- C. recordings quality suffers in my opinion, mainly due to lack of big monitors, even if analog consoles can be easily replaced by summing mixers etc.;
- D. due to the smaller environments, the acoustic design need to adapt to this phenomenon;
- E. modern calibration and active reverberation control systems might be useful to improve listening avoiding structural interventions.



Thank you!

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