

**Client:**

Company: Harman International | Revel

Project Director: Mr. Kevin Voecks, Director of Engineering, Revel

Harman International is the parent company for Infinity, Harman/Kardon, JBL, JBL Pro, Lexicon, AKG, Crown, Mark Levinson, Revel and Studer. Revel is Harman International's flagship speaker line, with the single goal to produce the world's finest loudspeakers. Revel offers speakers from \$1,000 per pair to \$23,000 per pair.

Revel designs and produces innovative, no-compromise loudspeakers that expand the art of home sound reproduction. With a complete focus on maximum performance and unparalleled quality, Revel delivers an experience with all of the passion and emotion intended by the artist.

Revel benefits from the vast resources of its parent, Harman International Industries: Harman Kardon, Infinity, JBL, JBL Pro, Mark Levinson and their mainstay, Harman automotive audio. Revel remains an independent company completely focused on maximum performance and quality above all other issues. The technical resources, testing facilities, and decades of experience in transducer and speaker system design encompassed by the Harman companies are enormous assets available to the Revel engineers.

Deliverable:

Presentation content, graphics, animations, speaker notes, PDF for emailing.



Detail:

Revel was a new luxury home audio loudspeaker to be sold by specialty audio-video dealers across the U.S. and abroad. The Revel Ultima Salon and Gem had set new levels of performance with the Revel Ultima which retailed at \$17,000 per pair. Revel needed a presentation that showed their brand, their methodology and salience in a very crowded market.

Context:

Revel was a new brand, a new direction. Dr. Sidney Harman, who founded Harman International wanted a speaker brand that epitomized the very best speaker that could be made. The design brief was simple: “make the best speakers in the world.” Harman had the infrastructure, and actively sought the best engineers, and technicians to assemble the best team for this new division. Kevin Voecks was hired as Chief Engineer and Director of Product Development for Revel. It was Kevin that I worked with to write and design this presentation.

Revel’s existing presentation was exceptionally engineering oriented, yet their audience was not engineers, they were audio enthusiasts, distributors, suppliers and retailers. My biggest hurdle was to synthesize technical terms and engineering accomplishments into real world benefits that the audience could relate to.

- Become a subject matter expert in audio engineering and psycho-acoustics
- Understand the brilliance of Revel’s pioneering research that correlated objectivity and subjectivity
- Communicate the methodology as the way forward for all research and development
- Become a champion of Revel’s research | engineering | measurement | correlation - approach
- Temper the intellectual engineering elements with the emotional elements of craftsmanship and pride of ownership



Materials Review:

Revel's original presentation, was like many other dedicated engineer's presentation - well researched, highly detailed and flawlessly accurate. It was however, too much content, inadequately illustrated and not well structured for the audience.

Objectives:

The presentation was designed to be used by key personnel in the company. From audio engineering conferences, to sales presentations, this was Revel's keynote presentation that had many roles to fill. Because of the versatility needed in the presentation, it was difficult to reduce the amount of content since it would be used in many situations. Most often, less than one-third of the presentation would be used. I eliminated much of the written copy from the slides and even after distilling much of the content, the final presentation had 138 slides. To show the audience the structure and progress of the presentation, I added a table of contents and chapter markers along the way.

- **Revel's directive - "to build the world's best speaker"**
- **Revel's research, engineering, manufacturing and design capabilities and unmatched resources**
- **Revel's differences between the competition**
- **Revel's breakthrough of the correlation between subjective listening trials and objective measurements**
- **A carefully selected line up of products for both medium to luxury price ranges**
- **The net result is a speaker that is superior by R&D and by listener's choice**
- **The brand's directive has been achieved**



Content:

I was responsible for content development, writing and presentation structure and organization.

To accomplish this I did an exhaustive literature search on audio engineering, psycho-acoustics, subjectivity in testing. I took the original notes that Kevin had provided and researched the library of Harman International. Located and read the published works of Floyd E. Toole, Sean Olive and other accomplished acoustic engineers. I also read other books on psycho-acoustics and acoustic engineering of loudspeakers, industry reviews of Revel speakers and Revel's competition.

I determined who would be the most important audience members of the press and potential distributors and dealers. I positioned the presentation to address their concerns: typically skepticism of new products, and reluctance to embrace objective measurements as having a correlation with subjective impressions. I synthesized all of this content and distilled it to be as visually and verbally succinct as possible.

This project was received very well, and I received many thanks from Kevin and compliments from many members of the company. The presentation was so successful, I was asked to write the copy for their new speaker debut, the Performa F30.

R

World leader in Research

Dr. Floyd Toole

Director Product Development

Harman International

Focuses primarily on the **acoustics** and **psychoacoustics** of sound reproduction.

Pioneered the now established methods of subjective and objective evaluations.

Ph.D from Imperial College of Science, London

Senior Research Officer, NRC

1988, 1990 AES Publication Award

Member of ASA, Fellow of AES

Past **president** of the AES



REVEL **H**istory Research Resources Manufacture Products Multi-channel Summary

E

Engineering



Development of **new drivers**

Implementation of **high technology**
engineering **equipment** to test components

Ability to **generate working prototypes**

REVEL **H**istory R esearch R esources M anufacture P roducts M ulti-channel S ummary

Wait...

“if it
measures
right,
it will sound
right”



“if it
sounds
right,
it will measure
right”

Objectivist

Subjectivist

REVEL

H^{istory}

R^{esearch}

R^{esources}

M^{anufacture}

P^{roducts}

M^{ulti-channel}

S^{ummary}

Direction



To achieve the **target**, prudent design decisions must be made.

Optimum performance is achieved by identifying the **correct** priorities

Tradeoffs are always involved in engineering, speaker engineering is **not exempt**

Philosophy

*“In the
audio business,
listening is not
a frivolous activity”*



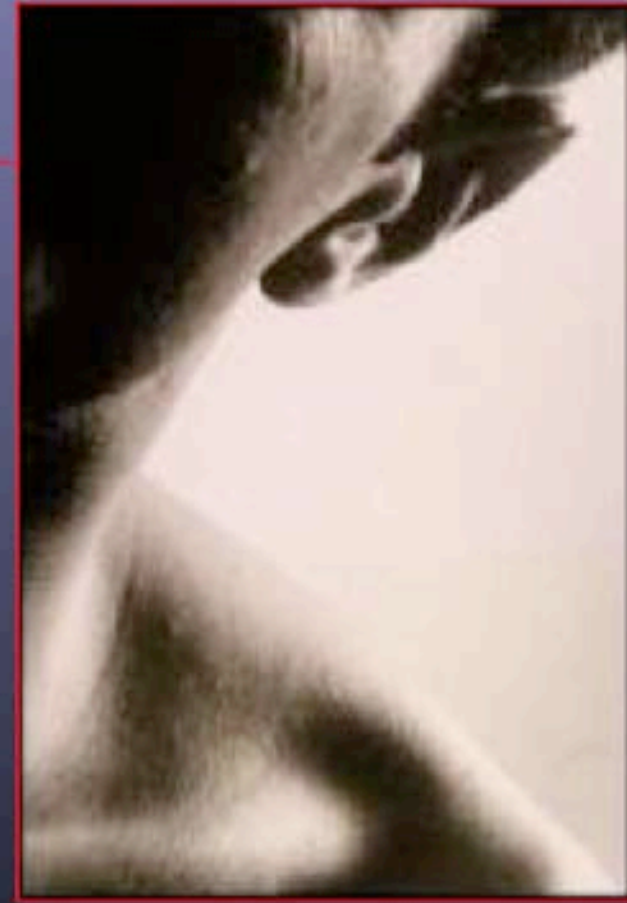
*“In the real world, one wishes to know
more than we presently know about
measurements and their relation to
perceptions”*

Dr. Floyd Toole, “Listening Tests -Turning Opinion into Fact”
Journal Audio Engineering Society, Vol. 30, No. 6

REVEL History Research Resources Manufacture Products Multi-channel Summary

Fact

“The importance of reflected sound on the perception of live and reproduced sound is unquestioned.”



Sean E. Olive and Dr. Floyd Toole, “The Detection of Reflections in Typical Rooms” *Journal Audio Engineering Society*, Vol. 37, No. 7/8

REVEL History Research Resources Manufacture Products Multi-channel Summary

listening

Correlation measured vs. listening

3. Psychological

group interpretation
personal interpretation

measurement

2. Physical

room acoustics
loudspeaker interaction

1. Physiological

auditory influences

REVEL

History

Research

Resources

Manufacture

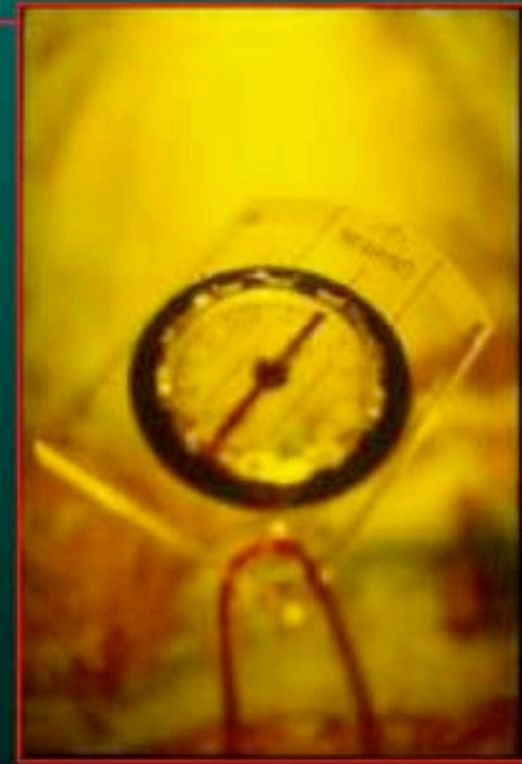
Products

Multi-channel

Summary

Resources

We have created a research methodology that is proven to be sonically **relevant**



Now that we have identified
the way forward
what resources will we need to accomplish this?

Anechoic Chamber

60 Hz 4pi

10,000 cubic feet

Calibrated to +/- 0.5 dB
below 60 Hz

Accurate to 20 Hz!

Essential for full range
speaker design

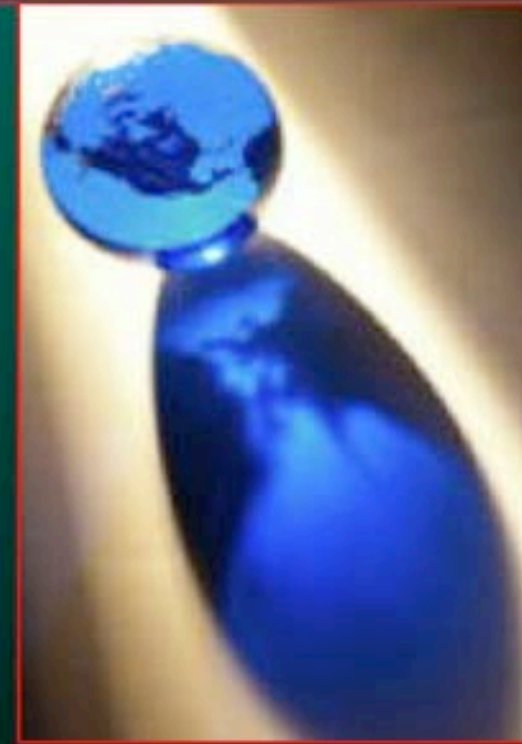


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Relevance

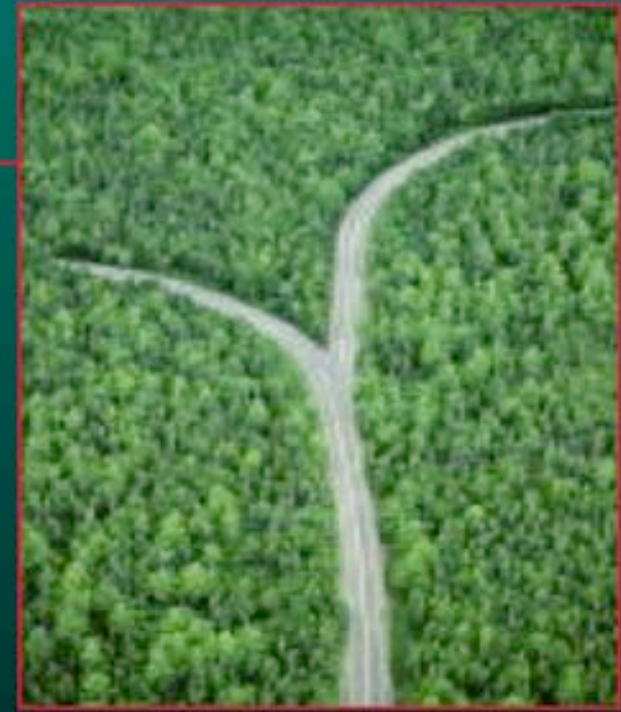
To build **the world's best speaker**, it must perform well in home's all around the globe.

By using six listening rooms we are able to mimic room sizes, building materials, and **acoustic characteristics** of rooms found in all regions of the **world**.



Ambition

*“For years we have
been trying to
correlate **measured**
performance in a way
with what is **heard**.”*



*“Only here in Harman’s labs we have **achieved** it.”*

Dr. Floyd Toole

REVEL History Research **R**esources Manufacture Products Multi-channel Summary

family

ULTIMA

REVEL



Salon



Studio



Gem



Voice



Embrace



Sub 15



LE - 1

The finest speakers in the world