Hearing Loops 201

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Hearing Loops 201

Introduction

STEVE REUNBERLEY, Managing Director
Listen Technologies, Inc. Midvale UT

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Who is Listen Technologies?

Assistive Listening and Communications Manufacturer
Located in Bluffdale, Utah

As a global leader in wireless communication solutions, Listen Technologies can help anyone connect to meani[LISTEN TECHNOLOGIES]e identified by pure, focused s[LISTEN TECHNOLOGIES] everyone deserves to hear the world around them, and we work to make this vision accessible in any venue.

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Why do standards exist?

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Standards can support

- Safety
- Reliability
- Government policies
- Interoperability
- Business benefits
- Consumer Choice

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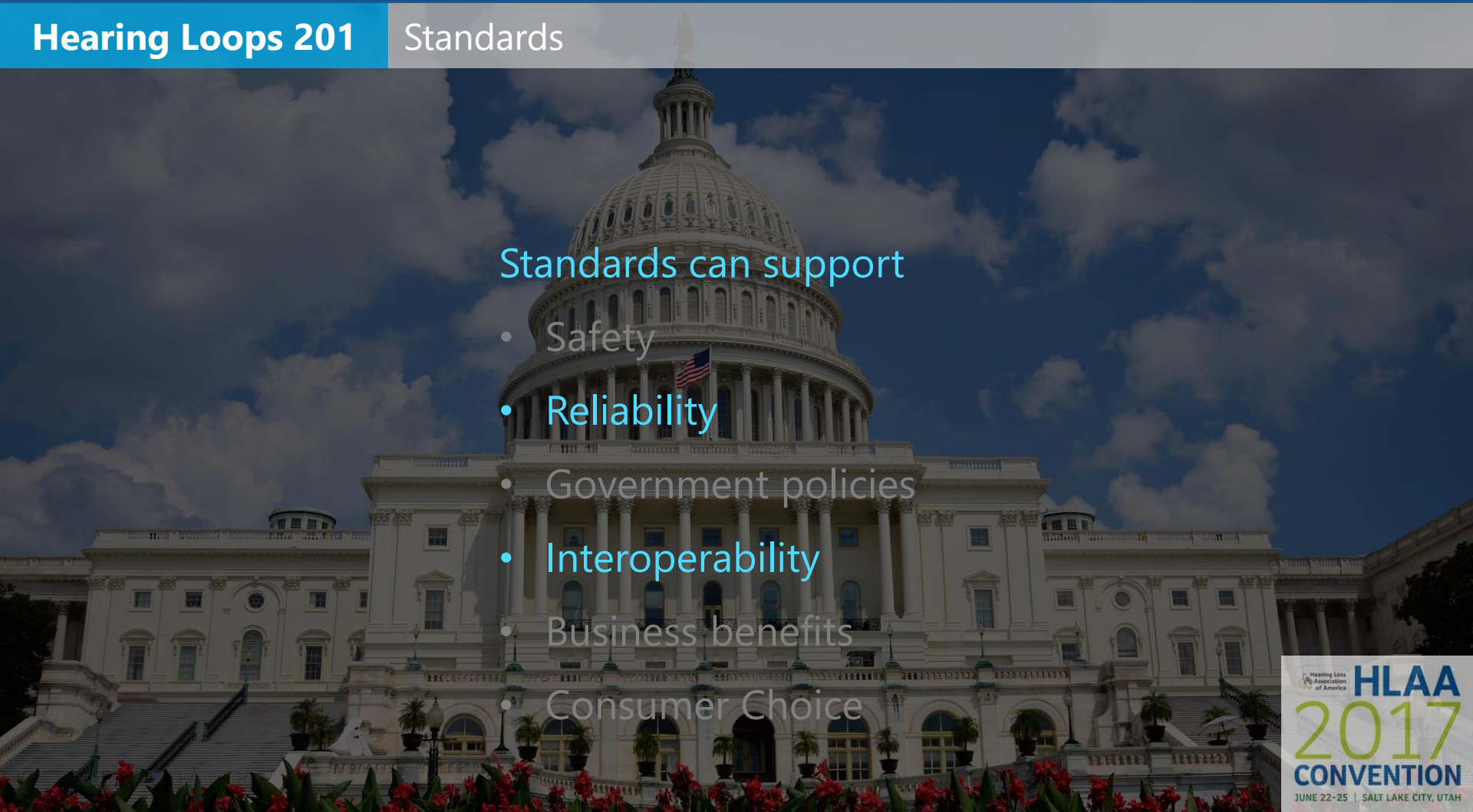

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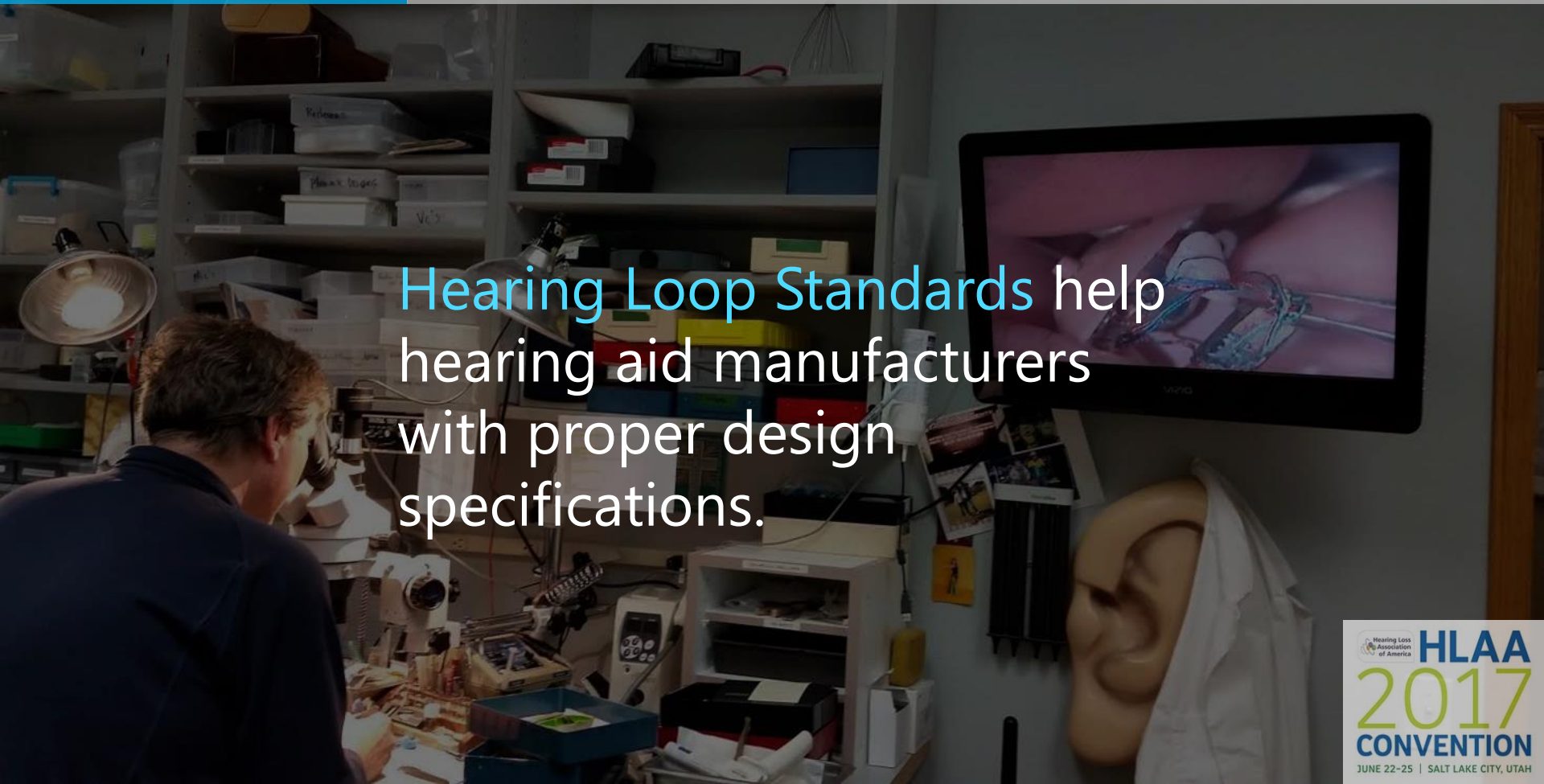
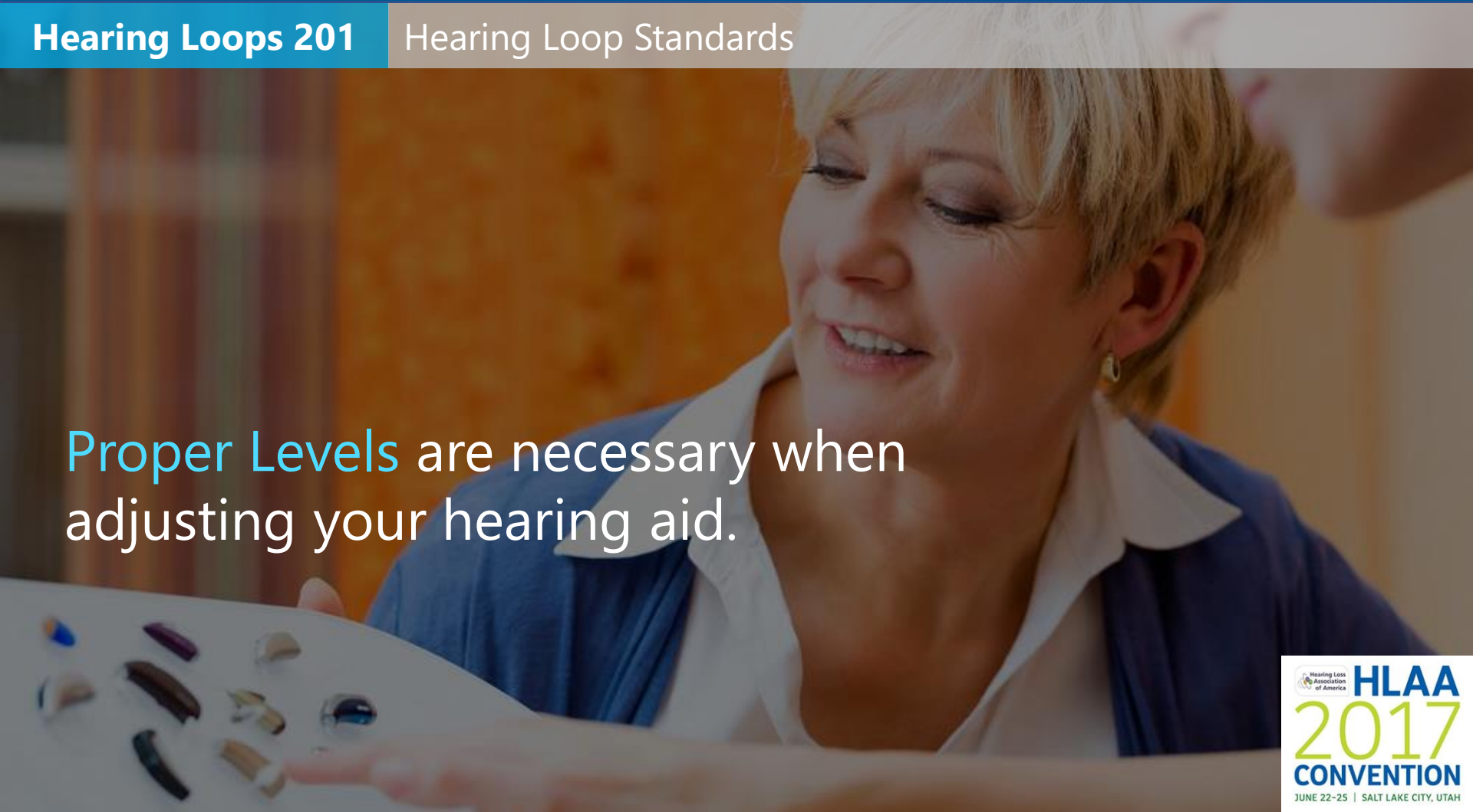


Hearing Loop Standards help hearing aid manufacturers with proper design specifications.



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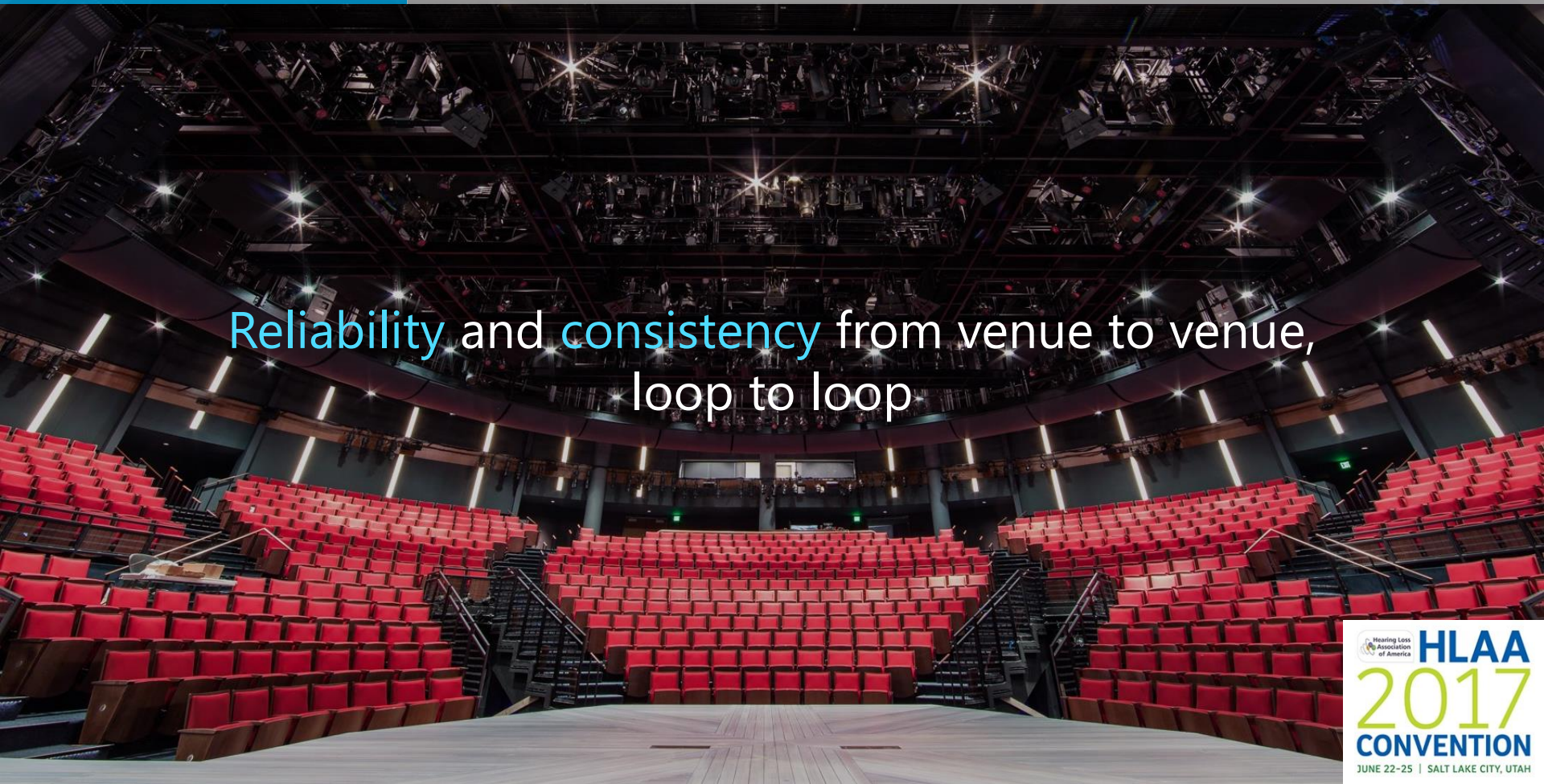

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Audiologist office loops set *too low* can cause *incorrect* judgements for hearing aid settings.

International Electrotechnical Commission

- Standard for induction loops for hearing aid purposes
- Performance standard for installed systems
- No such thing as an “IEC 60118-4 Certified Installer”
- Loop drivers are rated by a different standard, IEC 62489-1

Certification is for the entire system

- Design
- Installation
- Calibration

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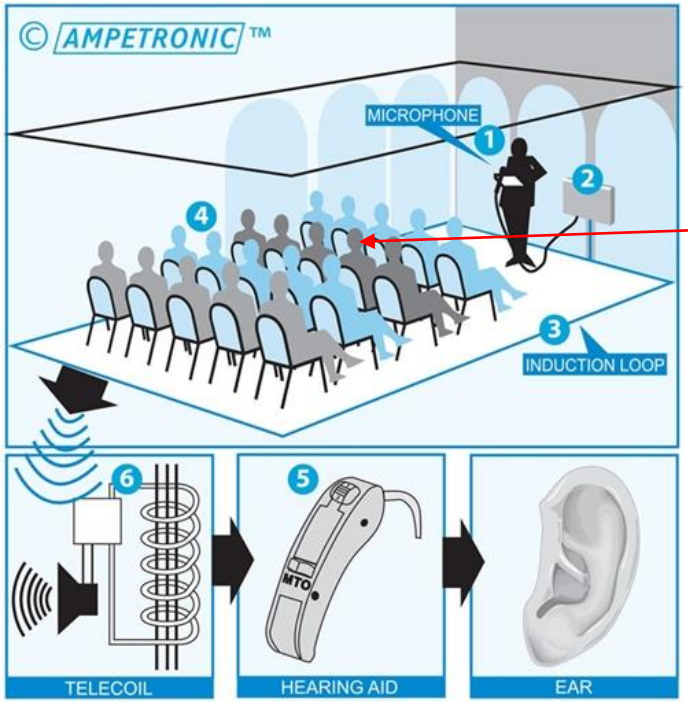

0 dB RMS signal level at ear
using a 1 kHz tone
(ref. 400 mA/meter)

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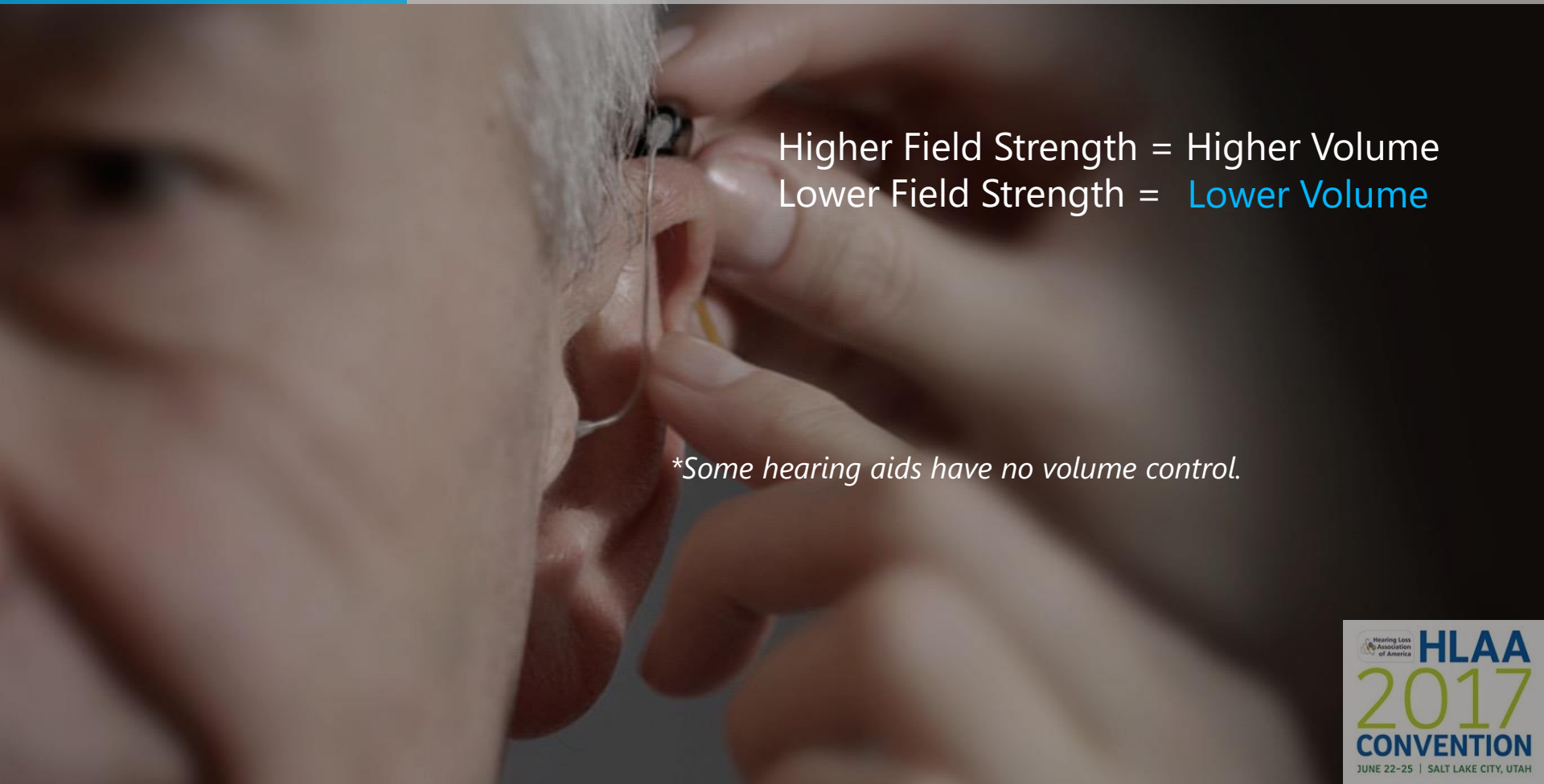

Higher Field Strength = Higher Volume
Lower Field Strength = Lower Volume

**Some hearing aids have no volume control.*

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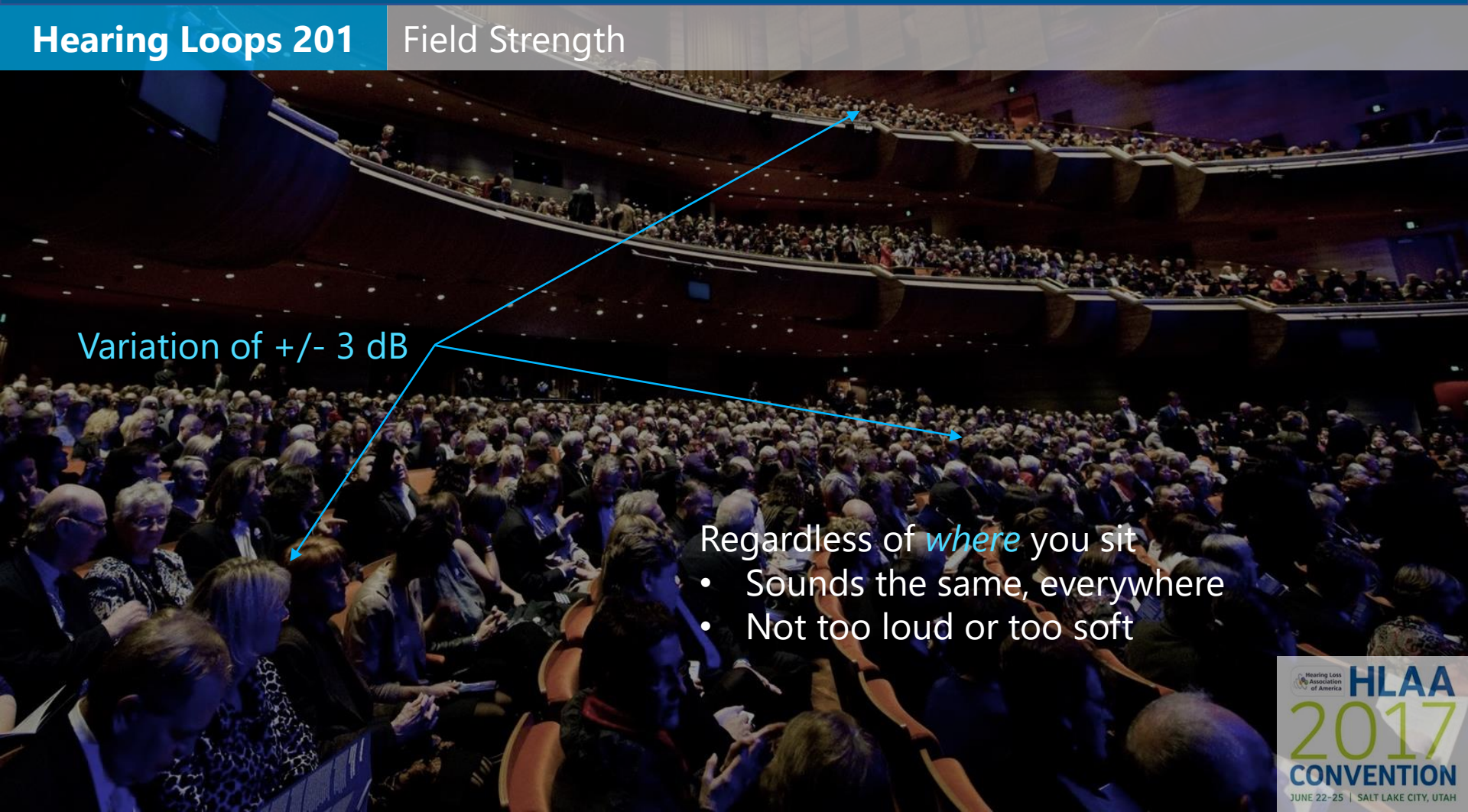

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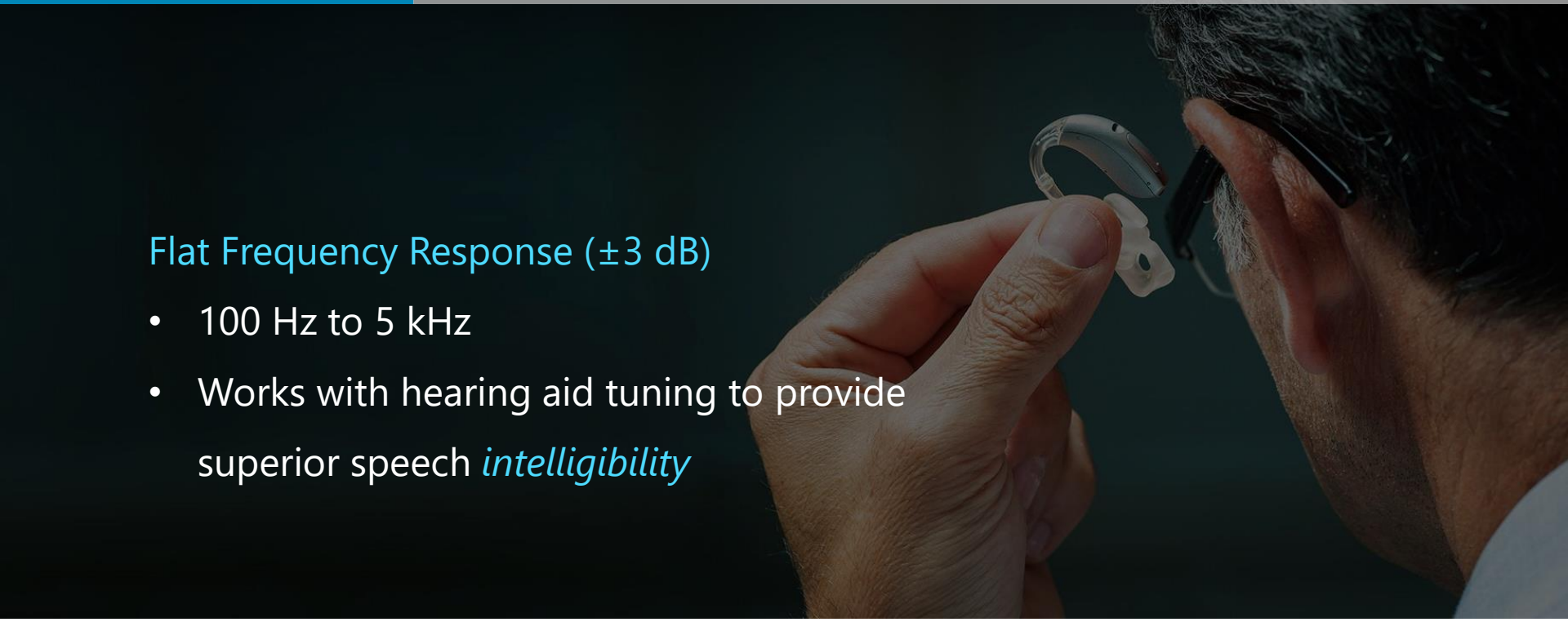
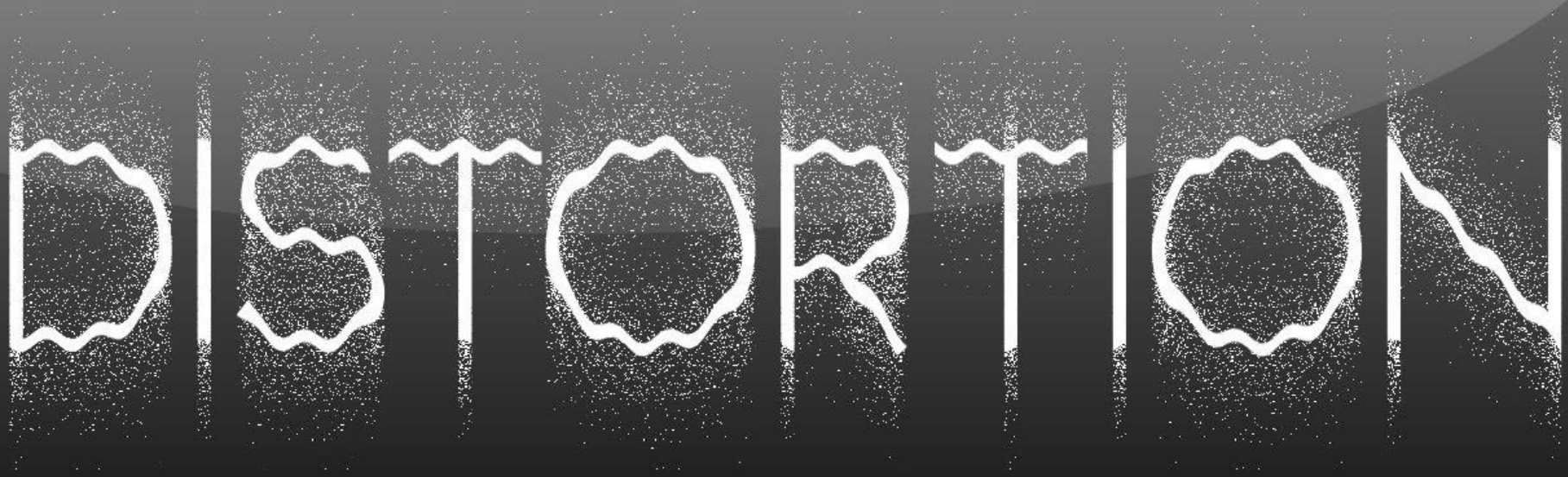


Flat Frequency Response (±3 dB)

- 100 Hz to 5 kHz
- Works with hearing aid tuning to provide superior speech *intelligibility*

Hearing Loops 201 IEC 60118-4: Amplifier Overload and Distortion



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Amplifier clipping causes distortion.

- Conduct final check using 1.6 kHz tone
- Monitor driver for clipping

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- Can negatively affect intelligibility
- Can become annoying to the listener
- Should be less than -32 dBA
- Test with *experienced* hearing loop users, when possible

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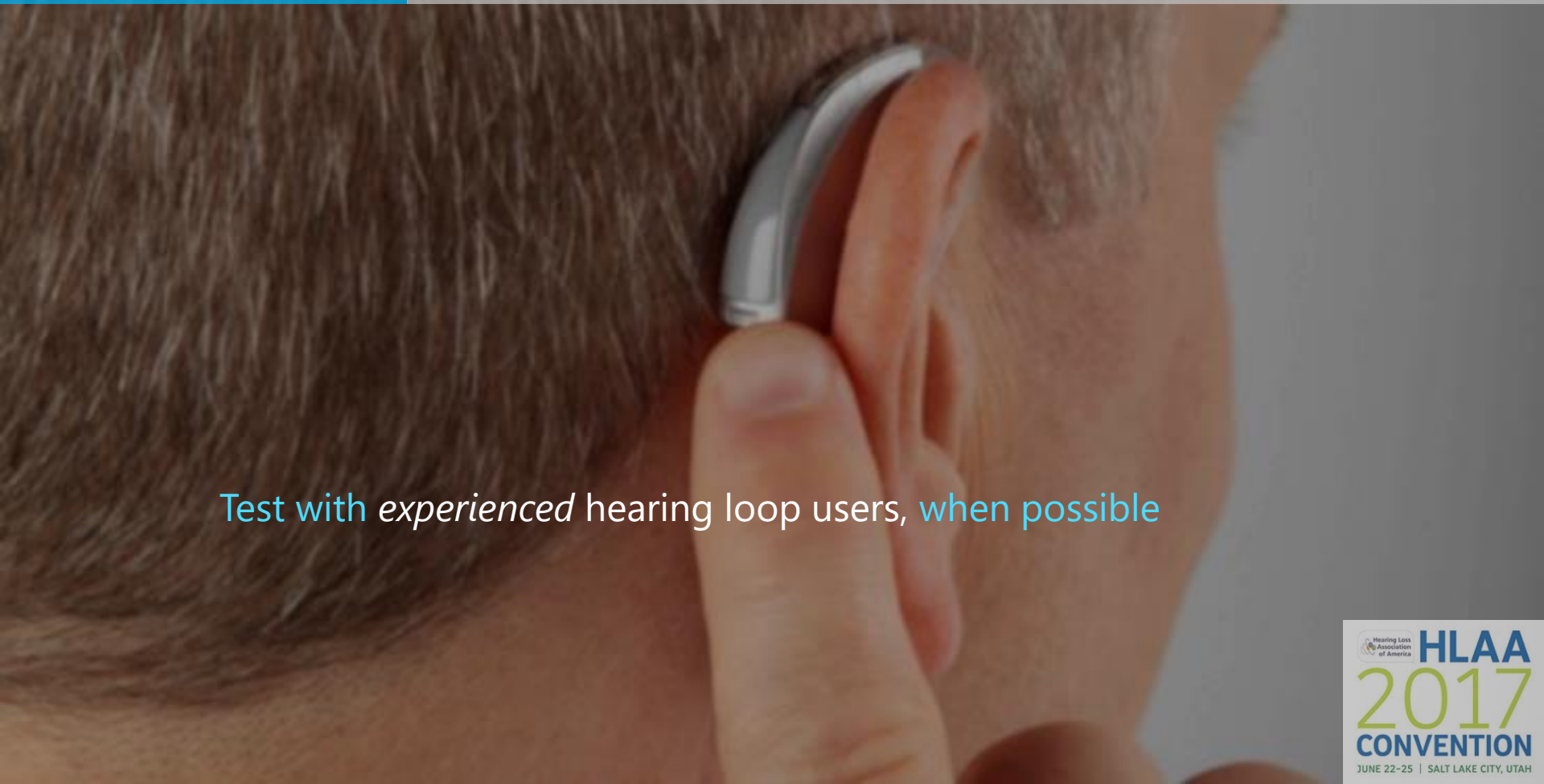

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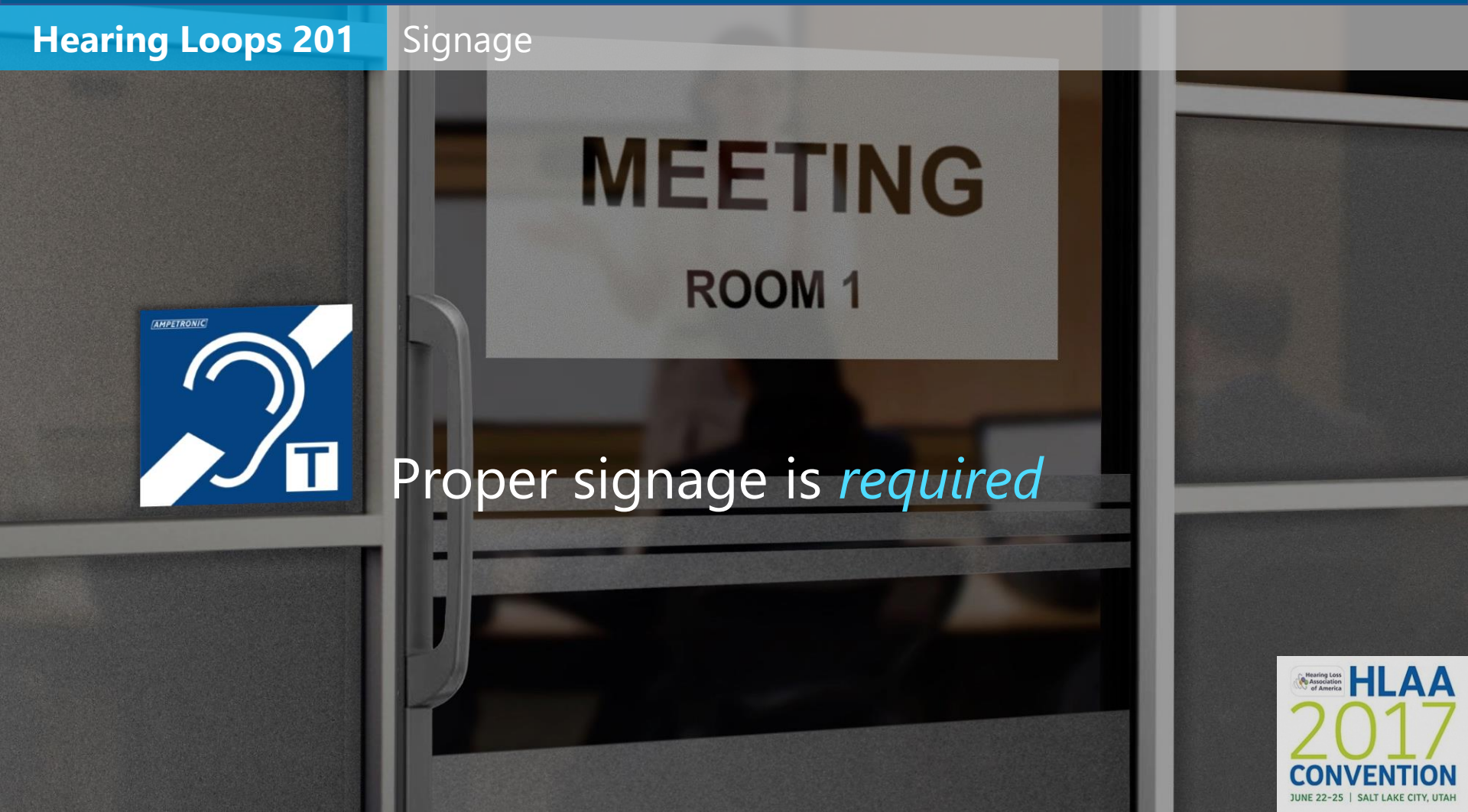

Proper signage is *required*

Richard McKinley

Manager at Contacta Inc

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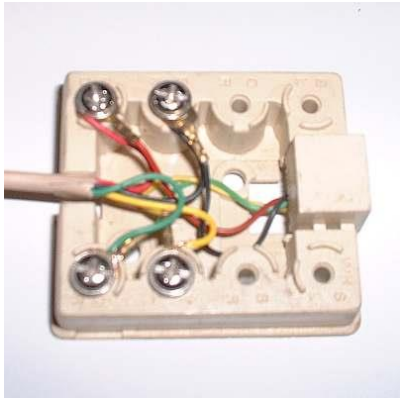
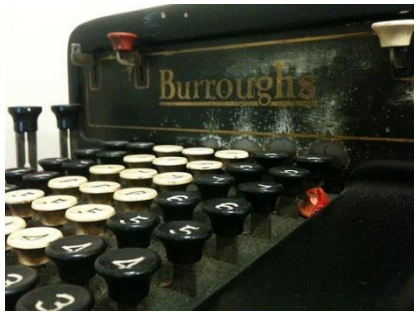
Loops of Yesteryear

Have been around for many years. Some were even used in the 60's and 70's as debugging tools for recording studios. Often installed using old telephone wire or lamp cord. Some even used tube amplifiers. Many were do-it-yourself systems installed for one or two individuals



Loops are Old Technology



<u>As is the</u>

Tire, Calculator

Bicycle, TV

Hearing Aid

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Advocates of Today's Loops

Mark Ross

Dr. Sam Trychin

Victor Matsui and Al Wolfe of Williamsburg, VA

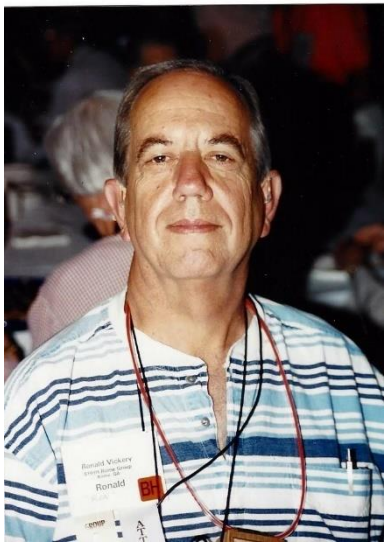
Dr. David Myers

Ron Vickery

(remember his loop receiver?)

And many more

(were any of them defined by their hearing loss?)



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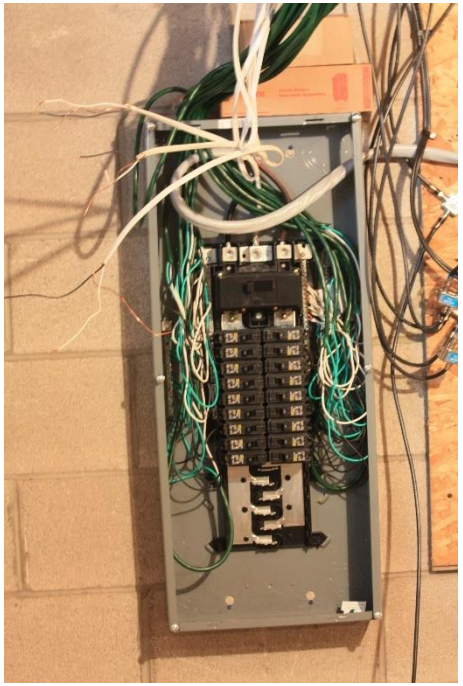
Progress in last 20 years

1. Interference from electrical equipment has been reduced.
2. The US Loop market has grown due to your efforts.
3. At the loop conference in England in 2013 we learned how far ahead of the UK the US is in properly installed working systems.
4. Hearing loop design, equipment and installation practices have dramatically improved.

Interference



Years ago sources of interference included

Fluorescent light ballasts

Tube TV's

Variable dimmers

Ungrounded services

Old knob and tube wiring

Poor wiring in general

(Still an issue but solvable)

User Driven Growth

Many of you are the reason for the growth of loops in the US.
It is reasonable to stand out in a crowd and
ask for **dignified** accessibility and, in the same manner,
to stand up and be heard when it is not available.

Hearing Loop Conference 2013

Held at Eastbourne, UK

1. We learned that legislation is not the total solution as it sells a large number of loops but not necessarily working ones. Not just “Tick The Box”!!
2. We learned how important the end users perspective is; since then a new Loop UK movement is underway.
3. Learned the pitfalls of poorly install systems that were never audited or inspected.
4. A major percentage of the attendees were from the US

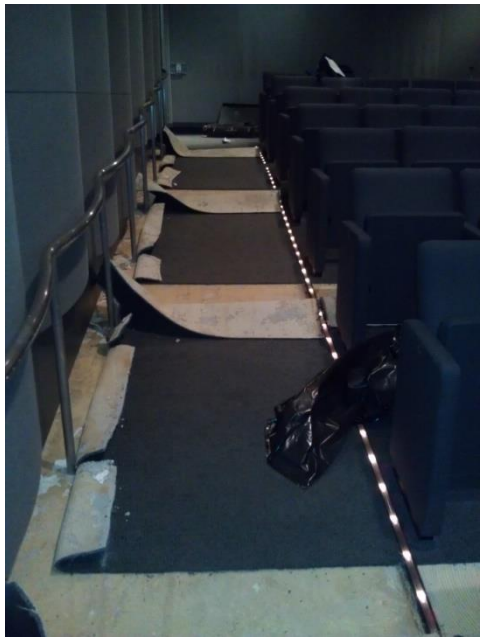
Loop Design, Certification and Equipment

1. Proper testing and design can 100% guarantee a good installation today.
2. While the IEC standard was written specifically for speech, we are learning today that with better equipment and designs, systems can reproduce the music heard in many venues throughout the US, such as churches and theaters.
3. Certification of an install has always been an issue. It is essential we confirm that the installers you work with are thoroughly trained, randomly inspected and backed by their providers/trainers.

How Designs Have Changed *(or, what to use when?)*

- For years perimeter loops were the standard, then multiple loop installations like the figure 8's.
- Today professional installers take into account all of the following factors: actual floor test data, musical instruments that will be used, microphone and source audio, room design, head tilt, spill, music or speech, energy efficiency, **visitors**, and work toward covering 100% of the seated area

Installation Techniques



- The old saying was “just tuck the wire under the baseboard and go over and around the doors”. Thankfully, this has been replaced with “be professional, install it correctly and make sure the system is reliable and will last a long time”
- Today hearing loop cables are often scored into the concrete and fortunately more and more facilities think that allowing its clients to “hear” is more important than a few cuts in the carpet.

Some Examples of New Locations

- Hearing loops on all-steel boats
- Hearing loops on steel deck construction with little cement on top
- Loops on yoga floors
- Loops that work when people kneel
- Loops in buses and trams

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Phased Array systems

Cost about 50 to 60% more than perimeter/multiturn Loops.

However they

- Can reduce spill from room to room or up onto a stage/platform.
- Often are the only systems that can work.
- Sound a significantly better when properly designed.
- Use less current and energy when designed properly.
- Minimize the effect of head tilt.
- Have very little signal variation.
- Can be run at a lower power level and still be in spec

When Phased Arrays Are Required

Many of the following installations could only be done with a phased array system

- All-steel boat or ferry
- Large meeting room
- Rooms that can be divided
- High seat-rise locations
- Performing art centers
- Courtrooms
- Facilities with thin cement over steel deck construction
- Often airports

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Technology Allows Us To -

- Install loops where interference has been mitigated
- Install loop systems that sound great with music
- Install loops that have less chance of interference with the performance system sound system
- Install loops in more settings and meet new applications
- Hide the new smaller wiring more easily

Technology Allows Us To – *Continued*

- Know, with pre-testing , a proposed loop system will work well and perform to the desired standards – no surprises.
- At reasonable cost, effectively bring proper hearing assistance to those who need and would use it.
- Reduce the cost of the equipment needed.
- Remotely monitor hearing loop systems, assuring they will function well when needed.
- ***And so much more. . .***

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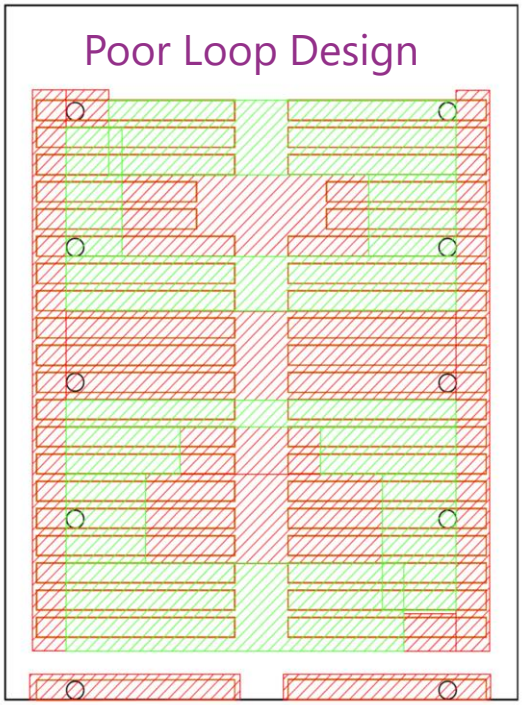
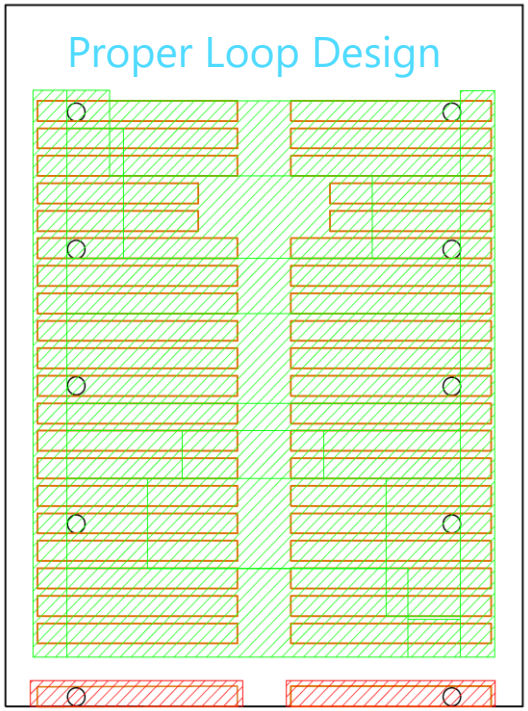
Proper Loop Design is Critical





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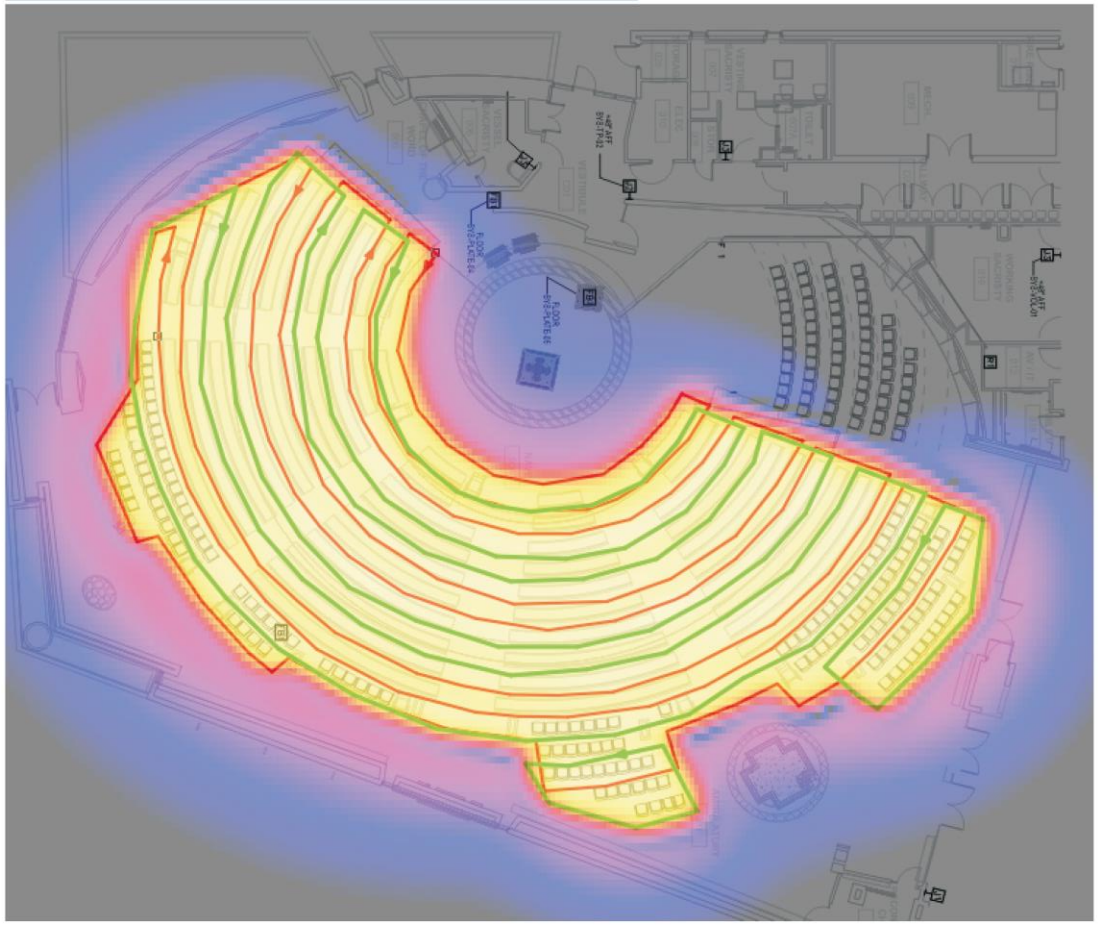
Verifying a Hearing Loop



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Basic System Check

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Standards

- Listen subjectively
- Listen for distortion or muffled sound
- Judge quality of sound

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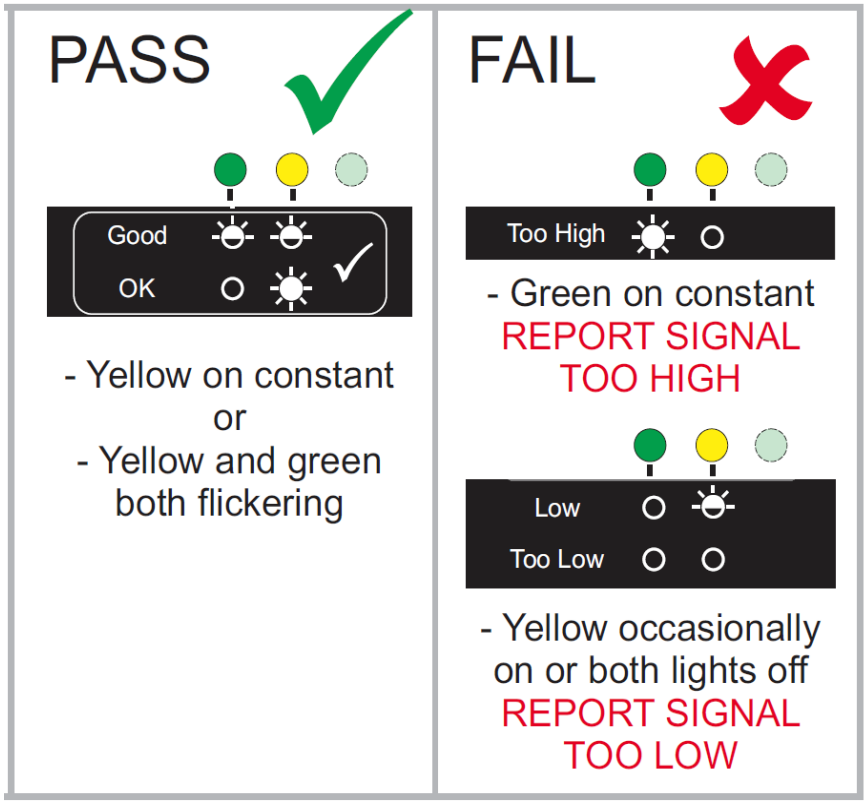
Basic System Check



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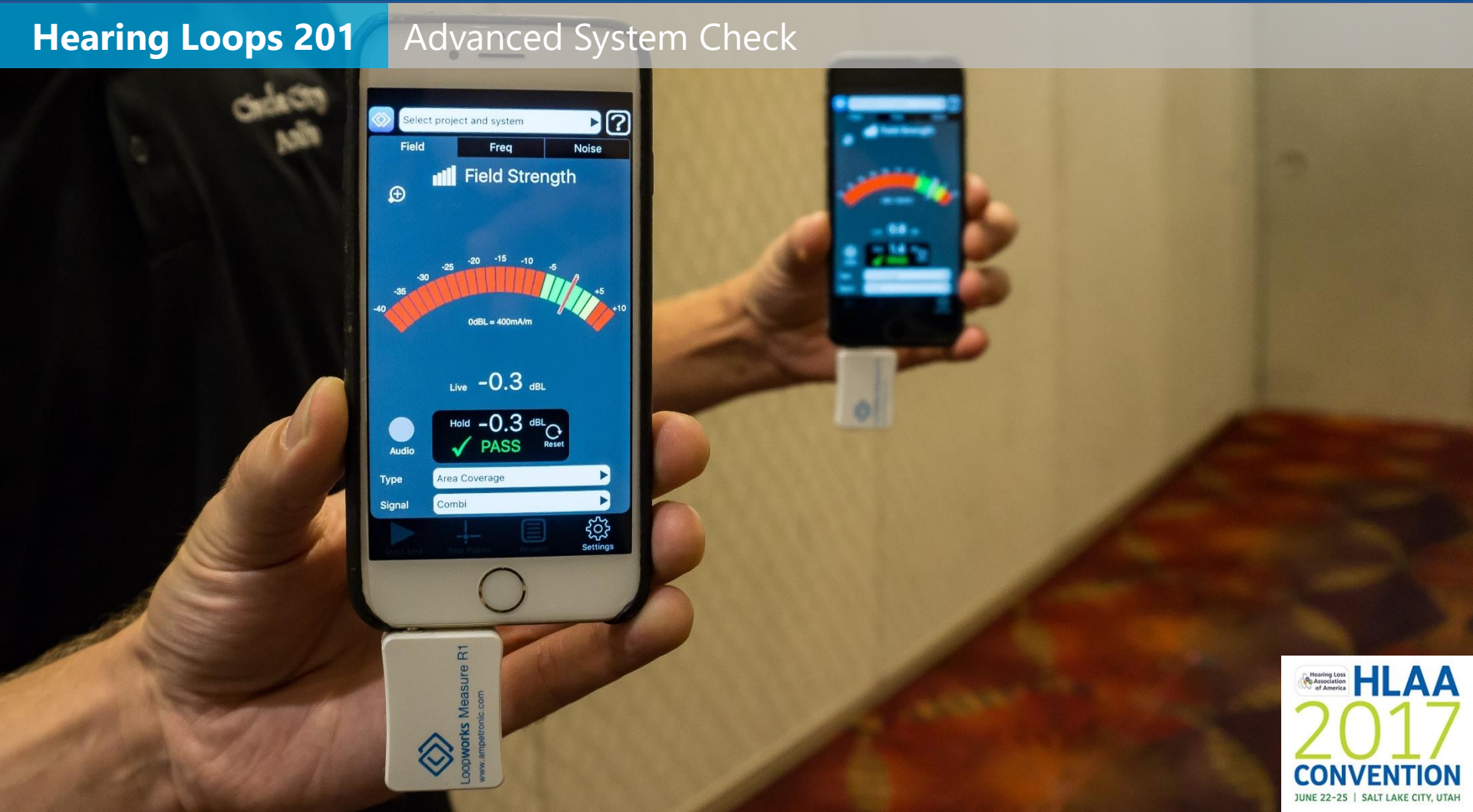
Advanced System Check



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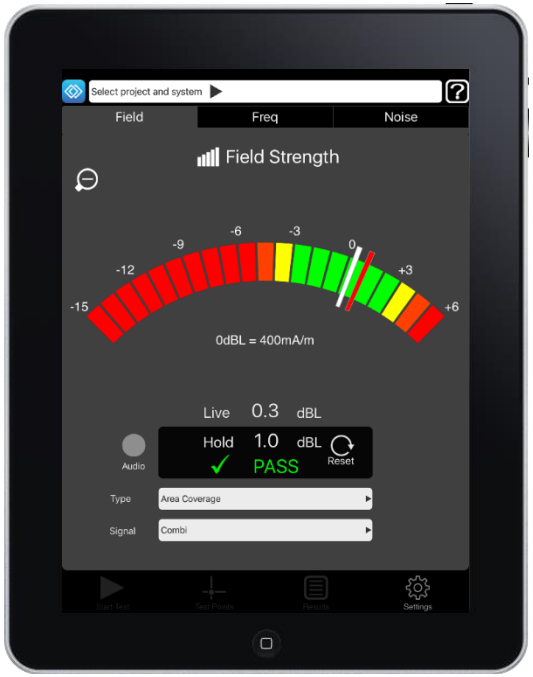
Advanced System Check



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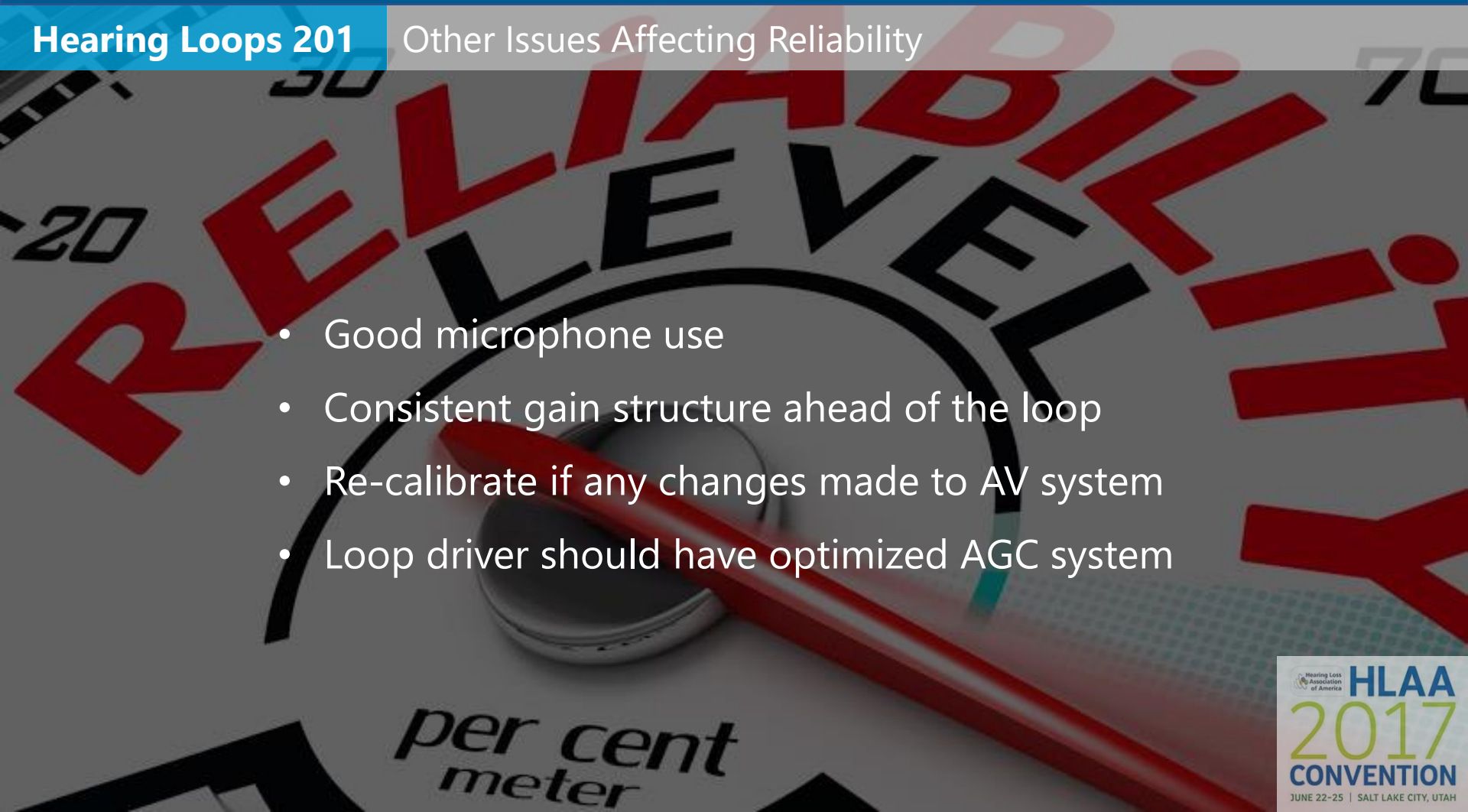
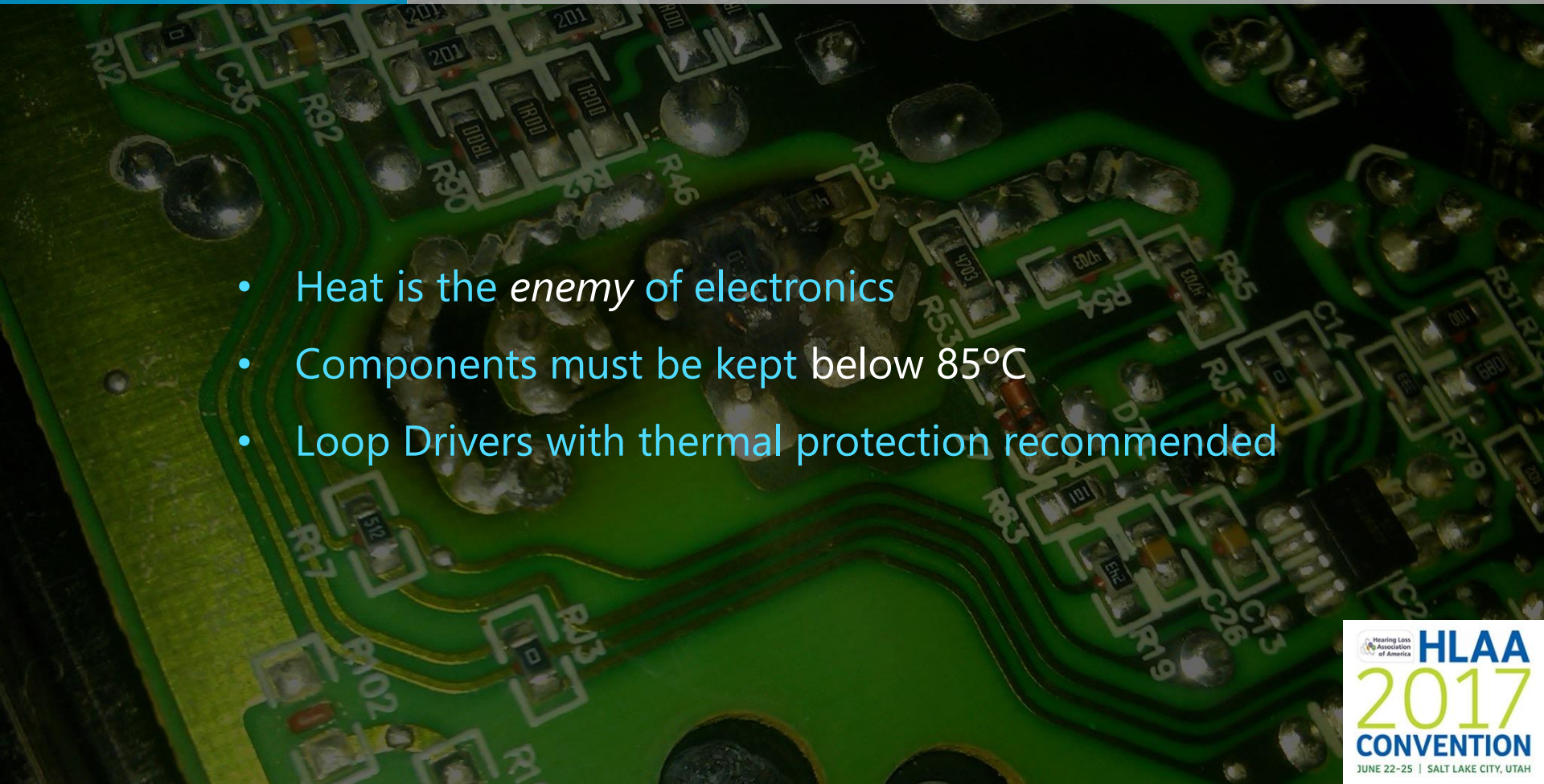


- Good microphone use
- Consistent gain structure ahead of the loop
- Re-calibrate if any changes made to AV system
- Loop driver should have optimized AGC system



- Heat is the *enemy* of electronics
- Components must be kept below 85°C
- Loop Drivers with thermal protection recommended

Alert System Recommended

- Faults often undetected until someone complains
- Newest drivers monitor the driver itself and the loop wire
- Send an email upon fault detection

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This is not the time to discover your loop driver has *failed*.

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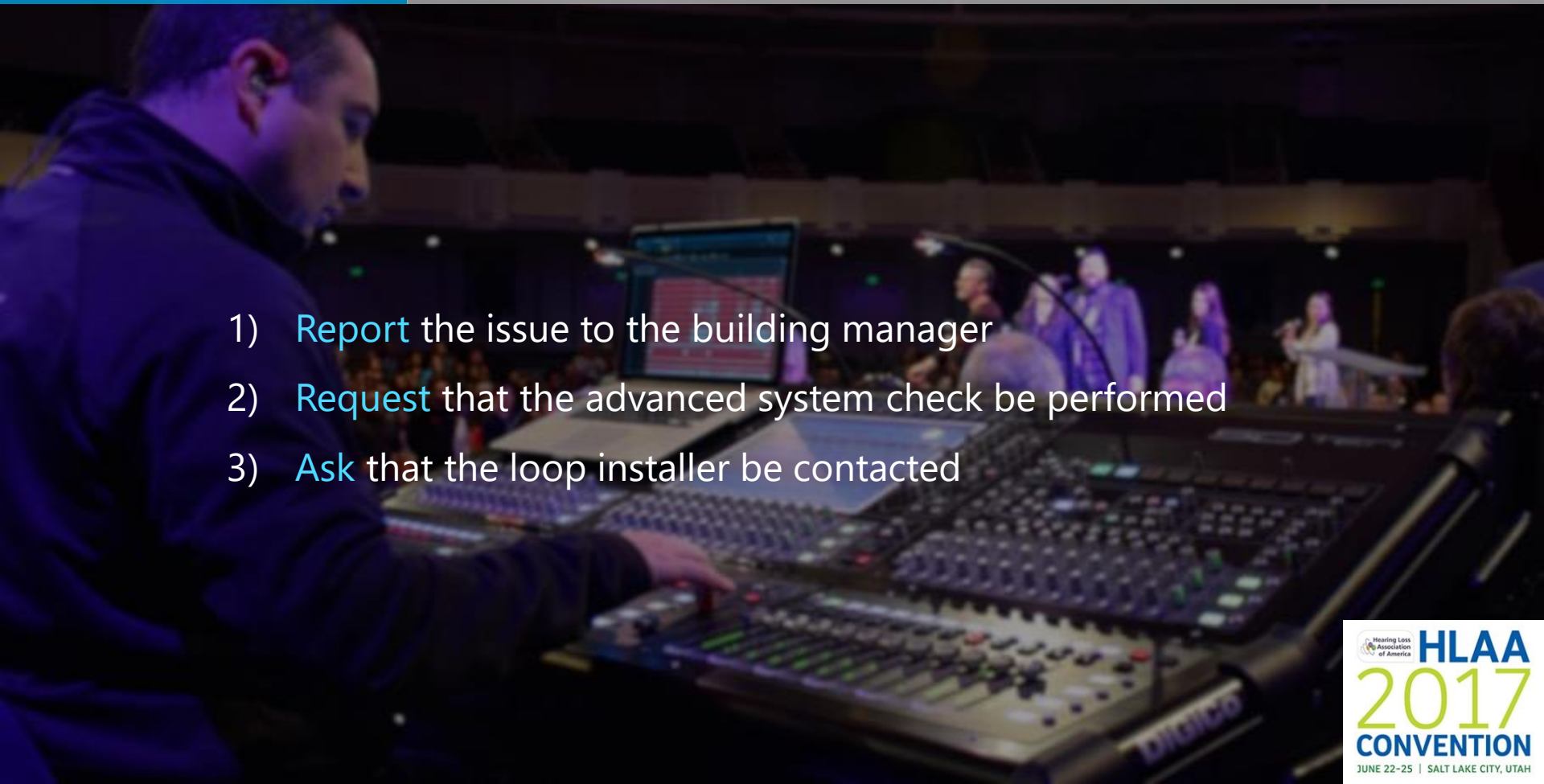
System non-compliant or non-functioning?



1) Report the issue to the building manager
2) Request that the advanced system check be performed
3) Ask that the loop installer be contacted

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Hearing Loops 201 | ALD Locator

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Presenters:

Steve Thunder, Hearing Loop Sales Engineer
Listen Technologies

Richard McKinley, Managing Director
Contacta

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