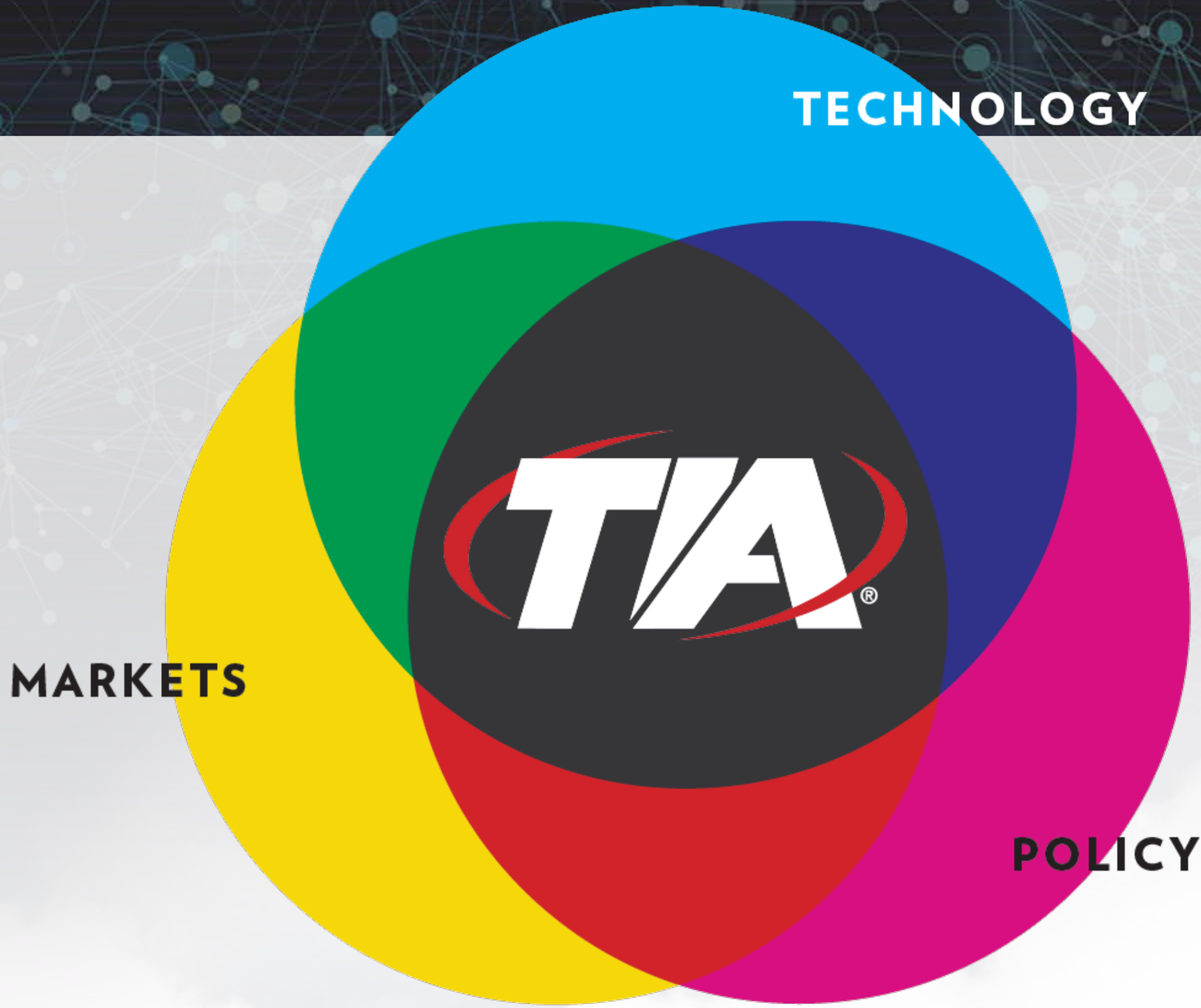

Developing Standards for Accessibility

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Brian Scarpelli
Director, Government Affairs
+1.703.907.7714
bscarpelli@tiaonline.org

http://www.tiaonline.org/policy/accessibility

http://tiaonline.org/all-standards/committees/tr-41

Agenda

- **Introductions / Background on TIA**
- **Wireline Telephone Handset HAC Magnetic Coupling**
  - FCC Rules
  - ANSI/TIA-1083-A: *How this voluntary performance standard affects you*
- **Wireline Telephone Handset Volume Control**
  - FCC Rules (and status of TIA petition for rulemaking with FCC)
  - ANSI/TIA-4965: *How this standard affects you*
- **High-Gain Amplified Telephones with Tone Control**
  - Addressing hearing loss and use of the telephone
  - ANSI/TIA-4953: *How this voluntary performance standard affects you*
- **Questions?**

Telecommunications Industry Association

- **Represents ~400 information and communication technology (ICT) companies**
- **Technology and standards development**
- **Policy and advocacy leadership**
- **American National Standards (ANSI) accredited standards development organization**
  - 12 engineering committees
  - 12 international advisory groups

TIA's Accessibility Mission

- **Encourage collaboration among stakeholders**
- **Development of voluntary, consensus-based, standards**
- **Increase the accessibility of technology for those with disabilities**
- **Encourage innovation**
  - Harness technology to open new communications opportunities
- **Proactive consultation with the disability community**
  - Understand the needs related to ICT products
  - Encourage accessibility solutions into member companies' product development process
- **Work with government regulatory agencies**
  - Encourage the use of voluntary, consensus-based, industry standards to address accessibility needs
  - Example: TIA-1083-A standard specifying reduced magnetic noise by telephones for users with T-coil equipped hearing aids

TIA Standards Development

- **TIA's TR-41 Committee "Performance and Accessibility for Communications Products"**
  - Voluntary standards for telecommunications equipment and systems performance
  - Strong focus on equipment used for voice services, integrated voice and data services, and Internet protocol (IP) applications
- **TR-41.3.14 (Accessibility Working Group)**
  - Performance standards for equipment features addressing hearing impairments and other disabilities
  - Telephone devices including handsets, headsets, and speakerphones
  - Participants from across the industry including accessibility consumer interests (such as Gallaudet University)

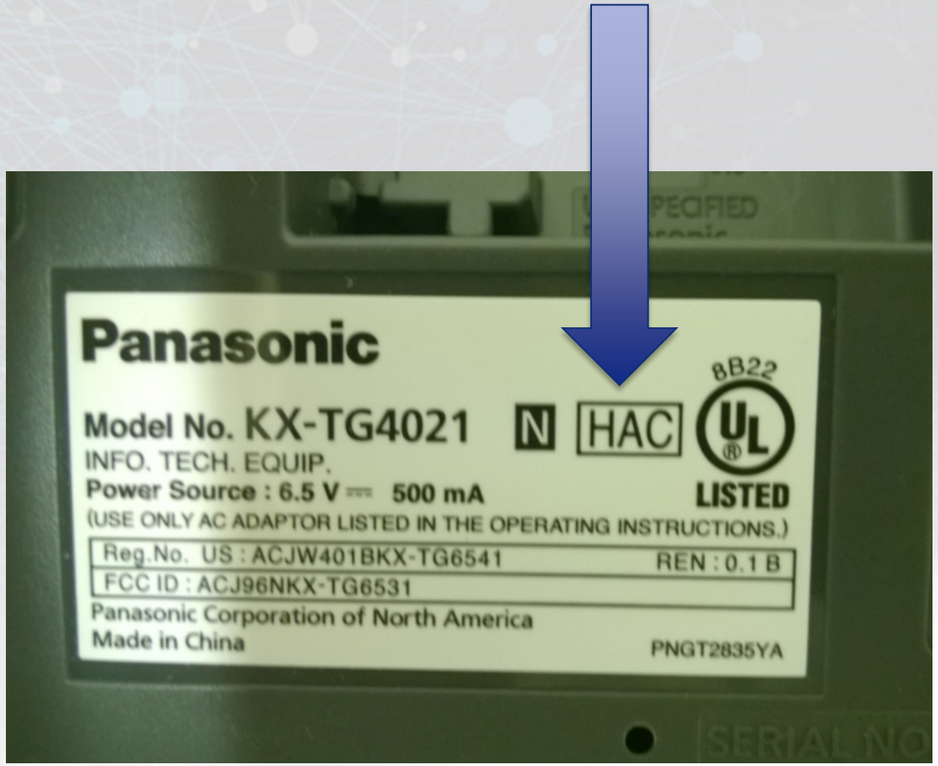
HAC Magnetic Coupling and Volume Control Requirements and Performance for Wireline Telephones

Tony Jasionowski
Panasonic – North America
Senior Group Manager, Accessibility

Member of TIA
Participant in TIA TR41.3 Accessibility Standards Development

201-348-7777 (voice)
Tony.Jasionowski@us.panasonic.com
http://www.panasonic.com/about/accessibility/

What is FCC Telephone Hearing Aid Compatibility?



What is FCC Telephone Hearing Aid Compatibility?

- **The Hearing Aid Compatibility Act of 1988 (the HAC Act)**
  - All wireline (including cordless) telephones in the U.S. are required to be hearing aid compatible (HAC).
  - The FCC established the technical requirements in CFR part-68.316
- **Improved performance for hearing aid users**
  - The telephone handset couples magnetically to a hearing aid's telecoil ("t-coil").
  - T-coil use reduces background noise heard by the hearing aid user.
- **The FCC rules do not address magnetically coupled noise (more on this later…)**

What is FCC Telephone Volume Control?

- **The FCC expanded the requirements for Hearing Aid Compatibility**
  - Became effective January 1, 2000.
  - All wireline (including cordless) telephones in the U.S. are required to have “12 dB” volume control gain over the nominal volume control setting.
- **Addresses the acoustic output from the telephone handset coupled to the microphone of a hearing aid, or directly to the ear.**
- **The FCC rules reference outdated TIA standards for the methods used to measure the handset’s acoustic output level. (more on this later…)**

Enhanced HAC Magnetic Coupling Performance

- **FCC's HAC Magnetic Coupling Requirements**
  - FCC 47 C.F.R. § 68.316
  - TIA developed the 68.316 rules which are published in the TIA-504 standard.
- **The Problems**
  - Technical requirements do not address impacts of magnetically coupled noise.
  - Biggest problems are for cordless telephones (including DECT).
- **The Solution: ANSI/TIA-1083**
  - Voluntary standard developed by TIA TR41.3 (published in March, 2007).
  - Addresses complaints of "buzz" noise often caused by cordless telephones.
  - Revised to include telephones with digital interfaces (including VoIP telephones) (published as ANSI/TIA-1083-A, November, 2010).

What's New for ANSI/TIA-1083-A?

TIA TR41.3 is revising ANSI/TIA-1083-A

- **Adding wideband audio requirements**
  - For telephones that support wideband audio.
  - Wideband audio improves intelligibility when listening to speech.

- **Allow using speech as a test signal**
  - Some telephones do not support using sine waves (tones) for test signals.
  - Will "future-proof" the standard for use with testing new product designs.

How ANSI/TIA-1083 Affects You

Look for the logo to ensure HAC magnetic compatibility performance

Look for the TIA-1083 Logo

Improving the FCC's Volume Control Rules for Regular Wireline Telephones (ANSI/TIA-4965) and Voluntary Performance Standard for Specialty Amplified Telephones (ANSI/TIA-4953)

James Bress
President, AST Technology Labs

Member of TIA
Chairman of TIA-TR41.3
Participant in TIA TR41.3 Accessibility Standards Development

321-254-8118 x100 (voice)
JRBress@asttechlabs.com
www.asttechlabs.com

Improving The FCC's Telephone Volume Control Rules

- **FCC's Volume Control requirements**
  - FCC 47 C.F.R. § 68.317
  - References outdated TIA standards for measuring handset acoustic output level. (using "ROLR": *Receiver Objective Loudness Rating*).
- **The Problems**
  - Outdated testing methods using ROLR may lead to incorrect measurements.
  - Outdated testing methods may cause a poor design to meet the requirements.
- **The Solution: ANSI/TIA-4965**
  - *"Receive Volume Control Requirements for Digital and Analog Wireline Terminals"*
  - Developed by TIA TR41.3 (published October 24, 2012).

How to Improve FCC Volume Control Requirements?

Conversational Gain

- A more rational and intuitive way to measure volume control
- **Conversational Gain =**
  How loud a voice is compared to a typical face-to-face conversation
  (two people talking face-to-face, 1 meter apart)
- 0dB conversational gain means the speech heard from the telephone is the same level that would be heard if speaking face-to-face 1 meter apart

How is Conversational Gain Measured?

- **Using standardized telephone testing equipment**

ITU P.58 Head And Torso Simulator (HATS)

ITU P.57 Type-3.3 Ear Simulator

The Technical Details….

The Transition from ROLR to Conversational Gain

- A standard unamplified telephone (the Western Electric 500-type telephone and equivalent models by other manufacturers) provides about 6 dB of Conversational Gain even though it has no volume control.

- The current FCC ROLR-based requirement for at least 12 dB of gain above the normal unamplified level thus becomes a minimum of 18 dB of Conversational Gain.

- The requirement to automatically reset if the ROLR-based gain exceeds 18 dB becomes 24 dB of Conversational Gain.

Status of TIA's Petition to The FCC for Rule Changes

- **October 25, 2012**
  - TIA filed a Petition for Rulemaking with the FCC. (see http://bit.ly/10ah86B)
  - Petition is for the FCC to reference ANSI/TIA-4965 (using Conversational Gain instead of ROLR) to measure wireline handset telephones' volume control
- **March 2013**
  - The FCC gave TIA's Petition a formal rulemaking number (CG Docket No. 13-46).
- **July 2013**
  - FCC released a public notice and received no opposing comments.
- **Awaiting FCC activity…**

How Conversational Gain Affects You

- **Uses a more intuitive reference**
  - 12dB gain means hearing speech 12dB louder than if speaking face-to-face
- **A better way to compare consumer products**
  - Permits a valid comparison of the sound levels produced by different devices
- **Manufacturers' volume control claims are easier to verify**
  - Brings fairness to the marketplace for equipment manufacturers

High-Gain Amplified Telephones With Tone Control

- **Specialty telephone product**
  - Sold in some retail channels
  - Offered for free from some state equipment programs
  - Used by people with hearing loss with or without using a hearing aid
- **Much higher amplification than a standard telephone's FCC 12 dB gain (or 18 dB of "Conversational Gain")**
- **Tone Control is a major feature**
- **Much higher amplitude acoustic ringer / alerter**

What Was the Problem?

- **No standard method to measure and evaluate a telephone's acoustic performance related to the needs of users with hearing loss**

Who Asked for a Solution?

- **TEDPA**
  (Telecommunications Equipment Distribution Programs Association)
  - State programs that buy and distribute equipment to people with disabilities
  - Collectively the largest purchasers of high-gain amplified telephones in the US
- **Amplified telephone manufacturers**
  - Managing claims of “gain” from competitors
  - Bring sanity to telephone RFP requirements
- **Amplified telephone consumers**
  - Need to know if an amplified telephone will meet the needs of their hearing loss
  - Need to know if an amplified telephone will work well when used **with a hearing aid**

Who Needs an Amplified Telephone?

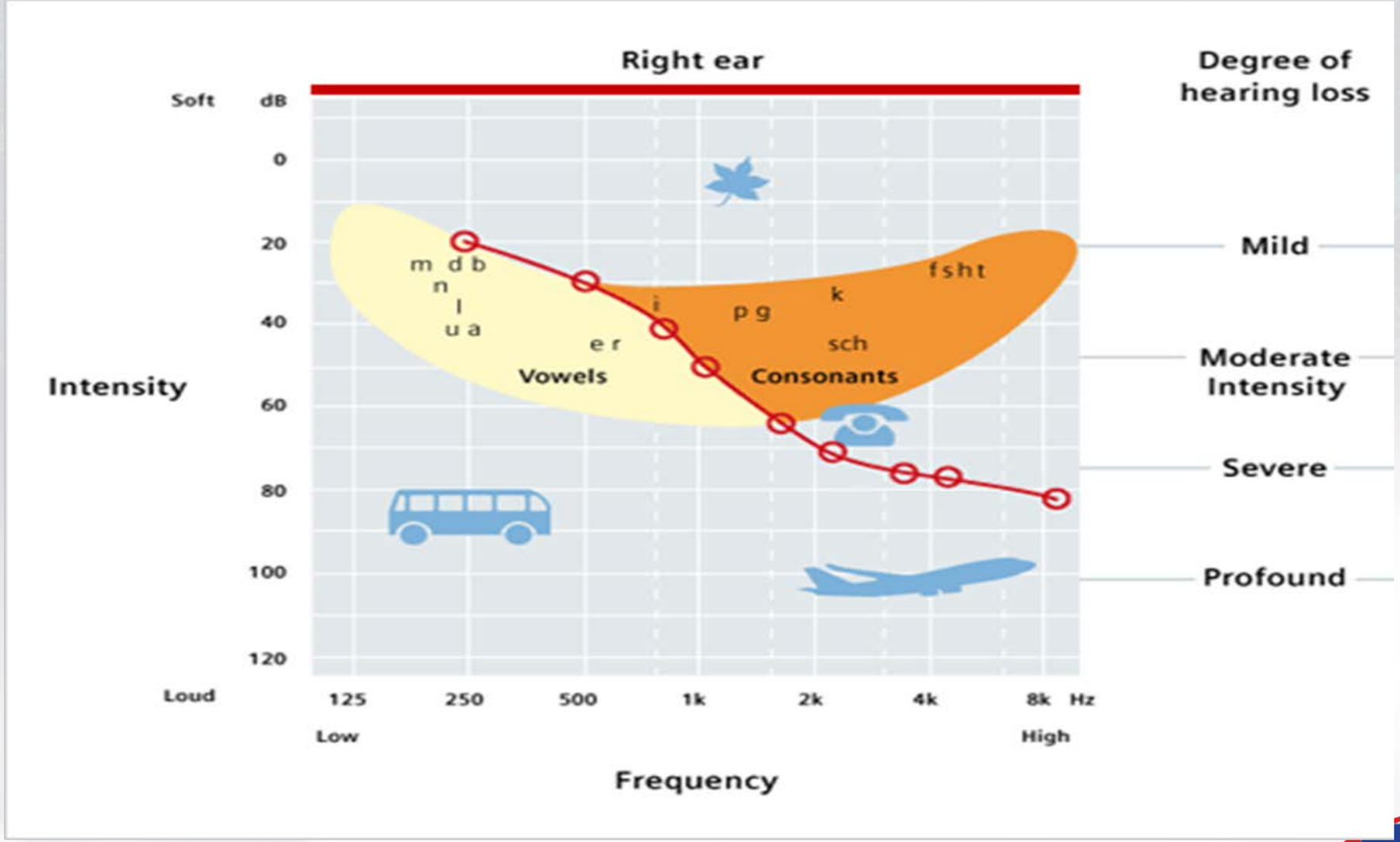
- **People with varying degrees of hearing loss**
  - Mild
  - Moderate
  - Severe

- **People with hearing aids**
  - Telephone to hearing aid acoustic coupling issues (microphone mode)
  - Magnetic signal performance for t-coil use (HAC)

Performance Standard for Amplified Telephones (ANSI/TIA-4953)

- **The Solution: ANSI/TIA-4953**
  - *Amplified Telephone Measurement Procedures and Performance Requirements*
  - Developed by TIA TR-41.3 (published in May 2012)
- **TIA-4953 Requirements Summary**
  - Volume Control (measured as “Conversational Gain”)
  - Tone Control
  - Acoustic ringer level and tone
  - Acoustic performance for hearing-aid users
  - Magnetic performance for hearing-aid t-coil users (TIA-1083)
  - Noise, distortion, stability (no howling), transmit levels

Why is Tone Control Important?



ANSI/TIA-4953 Technical Details Summary

Hearing Loss Category	Hearing Loss (HL) Range	Tone Control Type	Tone Control	Conversational Gain	Ringer Gain
Mild	20 dB to 40 dB	Flat Slope	0 dB	16 dB	11 dB
		Slight Slope	9 dB		
		Steep Slope	14 dB		
Moderate	40 dB to 70 dB	Flat Slope	0 dB	31 dB	21 dB
		Slight Slope	9 dB		
		Steep Slope	25 dB		
Severe	70 dB to 90 dB	Flat Slope	0 dB	41 dB	25 dB
		Slight Slope	9 dB		
		Steep Slope	21 dB		

- **Other: (Distortion, noise, transmit, stability)**
- **Unamplified Mode Acoustics Performance Requirements**
- **Acoustic Hearing Aid Compatibility Performance Requirements**
- **Magnetic Hearing Aid Compatibility Performance (TIA−1083−A)**

What's New for ANSI/TIA-4953?

TIA TR41.3 is revising ANSI/TIA-4953

- **Add requirements for the maximum volume control**
  - Distortion requirements for the maximum volume control setting.
  - Will help reduce user confusion.
  - Should help for Analog Terminal Adapter (ATA) interoperability.
- **Add requirements for sidetone**
  - Will improve complaints of noise and howling or squealing.
  - Should help for Analog Terminal Adapter (ATA) interoperability.
- **Add requirements for digital interface telephones (e.g., VoIP)**
  - Same as for analog interface except for different test signal levels.
  - Applicable to any digital interface handset product.

How ANSI/TIA-4953 Affects You

Look for the logo to make an informed decision

Summary and Questions

- **Hearing Aid Compatibility (HAC) (handset magnetic audio output)**
  - FCC rules work but more needed for some telephones (e.g., cordless DECT).
  - TIA TR41.3 developed and published the **ANSI/TIA-1083-A** voluntary standard.
- **Volume Control (handset acoustic audio output)**
  - TIA TR41.3 developed and published the **ANSI/TIA-4965** standard using "Conversational Gain" as the basis to address outdated FCC testing methods.
  - TIA petitioned the FCC to change the wireline telephone volume control rules.
- **Performance of Amplified Telephones with Tone Control**
  - TIA TR41.3 developed and published the **ANSI/TIA-4953** voluntary standard (also using "Conversational Gain" as the basis).
  - Acoustic output level of the handset (including tone control) and ringer
  - Coupling to hearing aids acoustically and magnetically (t-coil)

Thank You!