PINPOINT ALERT

Challenge Electronics Proprietary Sound Localization Tone

US Patent No. 10,522,008 B1

CHALLENGE ELECTRONICS

INDICATORS • SOUND TRANSDUCERS • MICROPHONES • SPEAKERS • ASSEMBLIES

CEML-21 2020-JAN-27
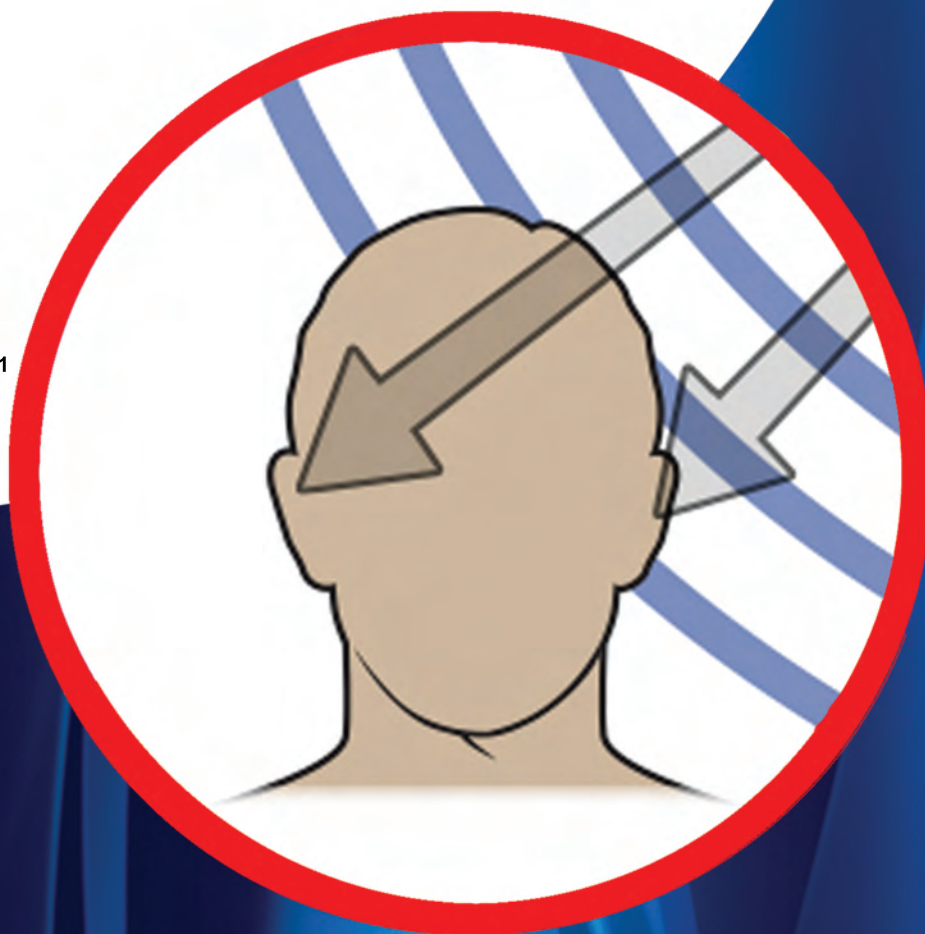
Q: What is Sound Localization?

- **A: Sound Localization is the ability for a listener to easily identify the origins of a sound**
  - As the human auditory system registers *Sound Localization*, the audio signal "bends" in relation to:
    - *Human Aural and Acoustic Cues*
    - *Direction of Generated Sound*
    - *Distance between Listener & Generated Sound*
  - These "bent" signals create a crisp, distinguishable and significantly improved acoustic tone when compared to standard acoustic tones!

Q: How do my ears register Sound Localization?

- **A: Sound Localization consists of the following aural and acoustic cues:**
  - **Interaural Time Differences (ITD$_s$)**
    - The differences in arrival time between each ear.
  - **Interaural Intensity Differences (IID$_s$)**
    - The differences in loudness between each ear.
  - **Pinna Filtering**
    - Sound passing through the ear pinna, the outer portion of the human ear, and filtering to the ear canal.
  - **Head Related Transfer Function (HRTF)**
    - Sound passing through the head and filtering to the ear drums.
  - **Correlation Analysis/Pattern Matching**
    - Repeatable patterns within a determined period from the same source reaching each ear.

Q: I have an audio component that could benefit from PinPoint Technology; can I simply intergrate PinPoint into my existing design?

- **A: Yes! PinPoint Technology can be synced into your existing product by utilizing:**
  - **ASIC**: PinPoint software is deployed as an Application Specific Integrated Circuit for easy integration to your PCBA design with your current transducer.

Minimum Footprint, Maximum Efficiency!

Q: Does Challenge Electronics stock products that incorporate PinPoint Technology?

- **A: Yes! PinPoint Technology is available in nearly all standard housings at little additional cost**
  - **Hardware Package:** Nearly all Challenge Electronics' Piezoelectric Indicators can be upgraded to utilize PinPoint Technology

Q: Could you provide an example of how the PinPoint Alarm Technology can be used?

- **Ex: A fire spreading in a manufacturing facility, causing electrical blackouts and producing large quantities of smoke.**
  - PinPoint Alarm Technology creates a clear and natural understanding of where the sound is generated from through Sound Localization, enabling personnel to safely and efficiently evacuate the facility.

Incorporating PinPoint Technology
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CEML-021 2020-JAN-27