

WELCOME TO SOUND INNOVATION

Welcome to the inaugural issue of *Sound Innovation*, a quarterly newsletter created by Akustica to keep you abreast of technology advancements that can help you deliver the voice improvements demanded by your customers for your products. As the use of personal communications becomes more mainstream, consumers have become more demanding about the quality of their voice communications, looking for their phone calls from the beach to sound as good as a call from the office. *Sound Innovation* aims to ensure that you are aware of the most current technologies that can help achieve this challenge.

Each quarter, we will explore the most timely topics affecting voice communications and provide you with access to leading-edge information that will help you understand emerging trends and evaluate new offerings. In this issue, we will look at ways in which voice input technologies can be used to drive improvements in voice quality across a wide variety of electronic products.

TAKING VOICE QUALITY TO THE NEXT LEVEL

The challenge to improving voice quality lies in the complexity of today's electronic products and the way consumers use them. For example, a mobile phone can be used as a handset, a speaker phone, or a digital still/video camera. And it can be employed in a variety of modes and settings including push-to-talk and outdoor arenas each of which requires very different acoustic solutions. With the right technology, you can implement the complex features that will differentiate tomorrow's electronic products and dramatically improve the quality of sound delivered.

[Full Story ...](#)

WHITE PAPER : Sensory Silicon™: Chips that can hear, speak and sense the world around them.

While the semiconductor industry has enabled significant size reduction and evolution in other electronics technology, people today are still using the same types of hardware for data input and output that have been used for the last 50 years. A revolutionary solution is emerging that promises to transform the human-machine-interface from pushbuttons and touch-screens to voice and motion through a technology known as Sensory Silicon™.

[Read the White Paper ...](#)

INDUSTRY NEWS



Handset sales reach new high in 2004



Notebooks to slim down in new year



Car, play me Eminem's latest hit



MEMS Enter the Mainstream



Digitizing analog circuits cuts chip area, increases performance

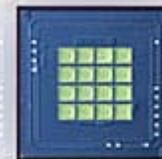
INDUSTRY EVENTS

- **SpeechTEK West 2005**
February 21-23
- **Intel Developer's Forum**
March 1-3
- **CeBIT 2005**
March 14-16
- **DAGA 2005**
March 14-17
- **HCSMA2005**
March 17-18
- **ICASSP 2005**
March 18-23
- **WinHEC 2005**
April 25-27
- **118th AES Convention**
May 28-31
- **COMPUTEX**
May 31-June 4

- To meet with Akustica at any of these events, [click here](#).

WHAT'S NEW AT AKUSTICA

- Recent Move



GET MORE INFO ON
AKUSTICA SENSORY SILICON

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TAKING VOICE QUALITY TO THE NEXT LEVEL

Dr. Marcie Weinstein, Product Marketing Manager

A decade ago the focus of the voice technology industry was on building an end-to-end digital infrastructure. Once this infrastructure was in place, priorities shifted to building the devices that could support voice traffic. Today, the focus has shifted to fundamentally improving the quality of sound capture. And a new wave of technology is emerging that can help you realize the potential of voice quality.

The challenges associated with improving voice quality at the input stage lie in the complexity of today's electronic products and the way consumers use them. New usage cases and features require enhanced audio performance for optimal performance. For example:

- ❖ Today a **mobile phone** can act as a handset, speaker phone, and video camera. For each of these diverse audio environments experienced today (e.g. push-to-talk, outdoors, concert), the optimal audio input solution is different.
- ❖ To support the widespread adoption of Voice Over Internet Protocol (VoIP) and video conferencing, **personal and mobile computers** will need to incorporate higher voice input quality that supports full-duplex speech and matches the video quality that has already been achieved in the web cameras.
- ❖ **Wireless headsets** are emerging as an answer to the automotive hands-free legislation in the United States and around the world. These headsets require wind-noise suppression and echo cancellation to achieve the voice command recognition and accuracy needed in the automobile.

There are three main approaches to improving voice quality across these devices:

- ❖ Incorporate **higher quality microphone components** that contribute less self-noise and that are more immune to their harsh surroundings (e.g. electro-magnetic and radio frequency interference, vibrations)
- ❖ Implement **voice processing algorithms** in conjunction with **multiple microphones** that work to suppress ambient noise, provide echo cancellation, and alleviate wind-noise.
- ❖ Use **multi-sensor clusters** to detect and cancel noise interference from vibration and monitor the proximity of the mouth to the microphone.

Selecting the right technology can effectively support the complex features that will differentiate tomorrow's electronic products and dramatically improve the quality of sound delivered. So how can you determine which one is right for you? Consider the following:

- ❖ Is space at a premium in your electronic device? Miniature surface mountable silicon microphones may allow you to implement a multi-microphone array solution which would be impossible with standard, larger electret condenser microphones.
- ❖ Does your device contain a processor for running audio algorithms? If not, could you utilize a solution where the microphone and algorithms are integrated into a single chip providing a clear signal directly from the microphone?
- ❖ Does your device contain a radio or antenna for wireless communication? Using RF-immune microphones (such as microphones with digital-output) will help to eliminate the design-time and shielding expense related to ridding RF interference on the audio path.

With the right technology, you can deliver better sound quality, and ultimately, better products to your customers. For more information on ways in which you can drive voice improvement, please consult the following:

❖ **The Fundamentals of Voice Quality Enhancement: A White Paper**

Embedded Edge

[Take me there ...](#)

❖ **Defeating Ambient Noise**

Microsoft Research and News

[Take me there ...](#)

❖ **Voice quality affects mobile phone user satisfaction**

NMS Communications independent survey results

[Take me there ...](#)

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