Microphone Housing Considerations

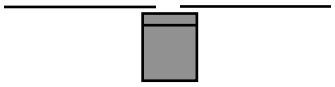
Proper design and consistent manufacturing of the microphone housing is important as improper acoustic positioning of the microphone will reduce recognition accuracy.

This section describes several important considerations that must be carefully followed in designing the microphone mounting and housing. Many mechanical arrangements are possible for the microphone element, and some will work better than others. Sensory recommends the following guidelines for designing the microphone housing:

FIRST: In the product, the microphone element should be positioned as close to the mounting surface as possible and should be fully seated in the plastic housing. There must be NO airspace between the microphone element and the housing. Having such airspace can lead to acoustic resonance, which can reduce recognition accuracy.

Good:

Mic. element flush with surface



Bad:

Air cavity between mic. element and surface.

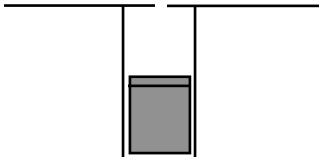


Figure 1 -- Microphone Mounting (1)

SECOND: The area in front of the microphone element must be kept clear of obstructions to avoid interference with recognition. The diameter of the hole in the housing in front of the microphone should be at least 5 mm. Any necessary plastic surface in front of the microphone should be as thin as possible, preferably no more than 0.7 mm.

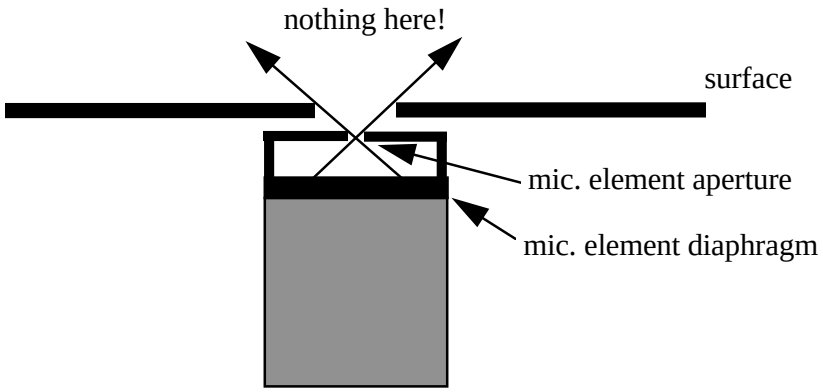


Figure 2 -- Microphone Mounting (2)

THIRD: The microphone should be acoustically isolated from the housing if possible. This can be accomplished by surrounding the microphone element with a spongy material such as rubber or foam. Mounting with a non-hardening adhesive such as RTV is another possibility. The purpose is to prevent auditory noises produced by handling or jarring the product from being "picked up" by the microphone. Such extraneous noises can reduce recognition accuracy.

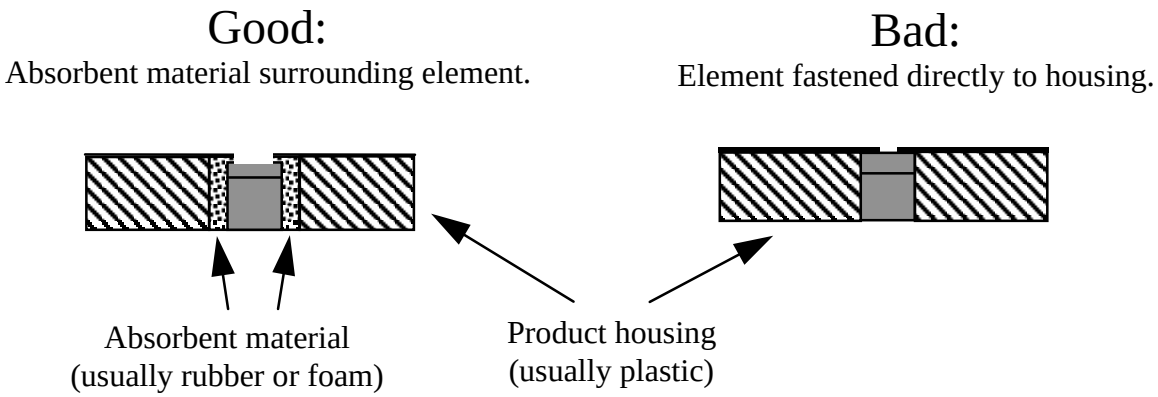


Figure 3 -- Microphone Mounting (3)

NOTE: If the microphone is moved from 6 to 12 inches from the speaker's mouth, the signal power decreases by a factor of four. The difference between a loud and a soft voice can also vary by more than a factor of four. The internal preamplifier of the RSC-4128 compensates for a wide dynamic range of input signal strength, but if its range is exceeded, software can provide auditory feedback to the speaker about the voice volume. The product can achieve this by saying such as "please talk louder" or "please don't talk so loudly.

The Interactive Speech™ Product Line

The Interactive Speech line of ICs and software was developed to "bring life to products" through advanced speech recognition and audio technologies. It is designed for cost-sensitive consumer-electronic applications such as home electronics, home automation, toys, and personal communication. The product line includes the award-winning RSC-4x general-purpose microcontrollers and tools, the *VR Stamp*™ 40 pin DIP module and tools, the SC series of speech and music synthesis microcontrollers. Our suite of software development kits are designed to run on non-Sensory processors and DSP's, and support most popular operating systems.

RSC Microcontrollers and Tools

The RSC product family contains low-cost 8-bit speech-optimized microcontrollers designed for use in consumer electronics. All members of the RSC family are fully integrated and include A/D, pre-amplifier, D/A, ROM, and RAM circuitry. The RSC family can perform a full range of speech/audio functions including speech recognition, speaker verification, speech and music synthesis, and voice recording/playback. The family is supported by a complete suite of evaluation and development toolkits.

Speech Recognition Modules and Tools

The VR Stamp™ is a complete speech recognition module based on the RSC-4x and is ideal for fast design and easy production. A low-noise audio channel and standardized 40-pin DIP footprint allow rapid prototyping, less debugging, and shorter time to market. The *VR Stamp Toolkit* includes everything needed to get started today, including VR Stamps, Module Programming Board, sample applications, and a complete set of development tools featuring the Phyton IDE and limited-life C compiler, QuickSynthesis™ 4 and Quick T2SI-Lite™ speech tools.

SC Microcontrollers and Tools

The SC-6x product family features the highest quality speech synthesis ICs at the lowest data rate in the industry. The line includes a 12.32 MIPS processor for high-quality, low data-rate speech compression and MIDI music synthesis, with plenty of power left over for other processing and control functions. Members of the SC-6x line can store as much as 37 minutes of speech on-chip and include as many as 64 I/O pins for external interfacing. Integrating this broad range of features into a single chip enables developers to create products with high quality, long duration speech at very competitive price points.

FluentSoft™ Technology

FluentSoft™ Recognizer is the engine powering the FluentSoft™ SDK. It provides a noise-robust, large-vocabulary, speaker-independent solution with continuous digit recognition and word-spotting capabilities. This small-footprint software recognizes up to 5,000 words; runs on non-Sensory processors including Intel XScale, TI OMAP, and ARM9 platforms; and supports operating systems such as MS Windows, Linux, and Symbian.

3Dmsg™ Technology

3Dmsg's (www.3Dmsg.com) Animated Speech technology offers animated avatars with advanced speech recognition and synthesis capabilities for use in smartphones, language trainers, and kiosk applications. Facial expressions can be configured to show emotions and lip synchronization can be automatically driven from voice or text data.

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