Siri Tests with Andrea’s Noise Cancellation Filters

It was assumed that Andrea’s noise cancellation filters would help Siri’s performance in noisy environments. To test this theory, loud crowd noise was played out of a loud speaker. Then simple commands were spoken to determine if Siri could accurately process the commands. The results are impressive.
Test setup:

1. Crowd noise is played from a speaker position 16” to the side of the microphone array. The crowd noise is measured at 70 dB at the microphone.
2. The person speaking the Siri commands is located 3’ in front of the microphone.
3. The audio from the microphone is processed through the noise cancellation filters on a DSP test board.
4. The processed microphone audio is piped into the iPhone 4s via a PSOC USB audio device.
Test Results

Four different filter options were tested.

1. No Filters – With no filters Siri had a success rate of 0%
2. Beam forming – With beam forming enabled Siri had a success rate of 100%
3. Beam forming with noise reduction – With beam forming and noise reduction enabled Siri had a success rate of 100%.
4. Beam forming with aggressive noise reduction – With beam forming and aggressive noise reduction enabled Siri had a success rate of 100%.

The difference the filters make in the audio can be seen in the following wave graphs:

No Filters

Beam Forming
Beam Forming + Noise Reduction

Beam Forming + Aggressive Noise Reduction