Condenser Microphone

A. Sheikh, J. Sakai, *Electrical and Computer Engineering, Carnegie Mellon*

***Abstract*—For the application of voice recording, a simple and cheap condenser-microphone design is considered. Analysis of theoretical characteristics such as sensitivity, dynamic range, and signal-to-noise ratio is presented. In conclusion, quantitative measurements from a working prototype are corroborated with the theoretical analysis and compared against desired performance characteristics.**

***Keywords*—Capacitive, Condenser, Microphone.**

I. Introduction

THE transduction of sound into an electrical signal using a microphone is naturally useful for conveying the human voice. Human conversation typically occurs within the range of 40-60 dB SPL at a frequency range of about 20 Hz to 20 kHz.[1] When converting human speech into an electrical signal, to ensure the output accurately represents the source, the microphone should strive for unity-gain response in the frequency range of interest.

A variety of devices exist for transducing sound. Of commercially viable designs, condenser and dynamic microphones are the most common.[2] It is not unusual for condenser microphones to have an upper 20 kHz frequency limit whereas dynamic microphones tend to have a 16 kHz limit.[3] This makes a condenser microphone preferable for applications involving voice. Fig. I shows the frequency responses of an Oktava MK-319, a large-diaphragm condenser microphone,[4] and the Shure SM58, a dynamic moving-coil microphone.[5]

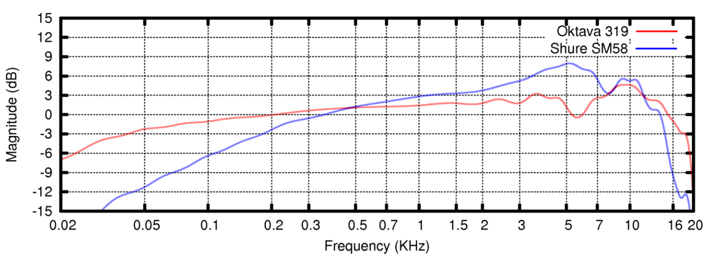

Fig. 1. Dynamic vs. Condenser Frequency Response

II. Sensor Structure and Measurement Principle

A. Sheikh, J. Sakai
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III. Conclusion

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Appendix A
Proof of the First Zonklar Equation

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Appendix B

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