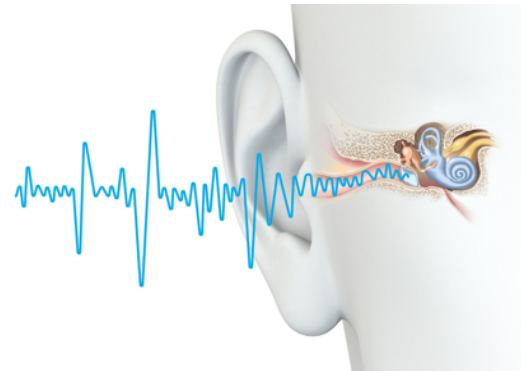
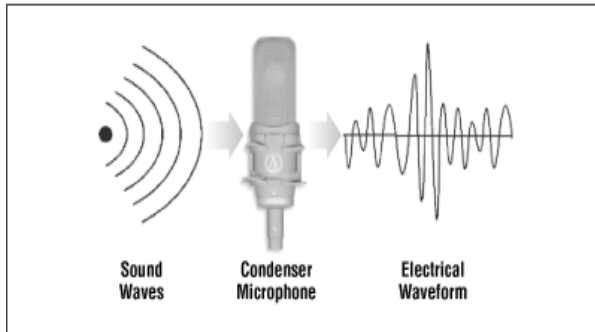


Handout 3 - Analog to Digital, a Basic Take on Waves

All sound is vibration. When you speak, you create sound waves that travel through the air. When you hear, it is because those vibrations have been registered in the inner cochlea region of your ear and transformed into electrochemical impulses that your brain converts into recognizable sound.



A microphone functions is similar to the human ear. Sound waves that enter a microphone apply pressure to an electrified diaphragm. This disruption in pressure is converted into electrical waves that travel through a cable and are then amplified and broadcast through speakers or recorded to magnetic tape.



The above instances of sound wave to electrical impulse conversion are known as analog sound. Advances in computer science have enabled digital modeling of analog sound in two primary fashions. First, in analog-to-digital conversion, the information in a sound wave is converted into numbers that represent that wave and that can be stored and used to re-generate a facsimile of the sound in the computer. Second, in digital wave modeling sounds are created by generating a similar wave from numbers. The

Yamaha DX-7 keyboard, released in 1983, was the first commercially available fully digital musical instrument.

Advances in both analog-to-digital conversion and digital sound synthesis have enabled home studios to become simultaneously much smaller and more powerful. Portable, computer-based programs such as Pro-Tools, Logic, GarageBand and others, known as Digital Audio Workstations (DAW), have either supplemented or replaced the mixing boards associated with the classic brick-and-mortar recording studios of the 20th century. The digital computer hard drive has all but eliminated magnetic tape from the average recording studio. Now, when a professional engineer chooses to record to tape, it is almost always an aesthetic decision rather than one of functionality.

