

Audio Demos played in class.

Key: (These are CDs that can be purchased online.)

1. Smithsonian Folkways Archival; The Science of Sound = SSS
2. NASA: Auditory Demonstrations in acoustics and hearing conservation; Glenn Research Center = NASA
3. Auditory Demonstrations by Houtsma, Rossing and Wagenaars (Institute for Perception Research and Acoustical Society of America) = AD

Frequency and Pitch

- SSS – Track 2; Frequency
- SSS – Track 3; Pitch and frequency
- AD- Tracks 12, 13, 14, 15; Filtering of frequencies (noise)
- AD- Tracks 17, 18; Frequency dependence of loudness, decreasing 5dB at different frequencies (compare with phon scale)
- AD-Tracks 27, 28; Frequency dependence of loudness, two tones compared (6 pairs); does loudness affect perceived pitch?
- AD-Tracks 29; Frequency dependence on tone duration
- AD-Tracks 30; Frequency dependence on masking
- AD-Tracks 31; Octaves; we don't hear a frequency 2x higher as an octave apart (second tone starts at 985 Hz and increases by 5 Hz each time to 1035 Hz)
- AD-Tracks 33; JND, 10 groups of four tones pairs (f and $f + \Delta f$); group 1 is a shift of $\Delta f = 10$ Hz, group 2 a shift of 9 Hz, etc.
- SSS- Track 10; Filtered music and speech (hearing loss)

Loudness

- SSS – Track 4: Intensity (decibels, inverse square law)
- AD- Tracks 8, 9, 10, 11: Broadband noise reduced in 6dB steps (track 8); 3dB steps (track 9); 1dB steps (track 10); voice at distances (track 11)
- NASA-Tracks 27, 28 (1kHz tone), 29, 30 (pink noise); decreasing in 10dB steps
- NASA-Tracks 31, 32; Frequency perception dependence of loudness- sliding tone

Timbre

- NASA- Track 11, 12; pitch versus timbre: triangle, square, sawtooth waves
- NASA- Track 13, 14; filtered piano harmonics
- SSS – Track 8: Fundamentals and overtones, harmonics
- SSS- Track 9; quality (filters out harmonics of whistle, singer and piano)
- AD- Track 1; picking out (cancelling) the 10 harmonics of a complex tone with 200Hz fundamental; Fourier analysis
- AD-Track 53; building up instrument by partials
- AD-Tracks 54, 55, 56; Envelope or attack frequencies change timbre

Oddities

- AD-Track 36; temporal coherence (pitch streaming); notes close in frequency form a coherent pattern, further apart they don't
- AD-Track 37, 38, 39; virtual pitch (missing fundamental) (37; 800, 1000, 1200 = 200Hz); (38; shift of 20Hz in each then 39: 850, 1050, 1250 = 210Hz);
- AD-Track 46, 47 chime (cue tones of partials)
- AD-Track 52; circularity (Shepard's illusion)