

MAS 432: Audio Production
Essential Terms and Concepts for Digital Recording

- What determines file quality and size?
 - Sampling Rate Per Second
 - International Digital Radio – 32,000
 - Compact Disc (CD) – 44,100
 - Laserdisc – 44,056
 - Digital Audio Tape (DAT) – 48,000
 - Digital Versatile Disc (DVD)
 - Quantizing – Introducing error in turning the samples into numbers

- What determines file quality and size?
 - Sampling Resolution
 - Determines the dynamic range of the file
 - The human ear is capable of hearing 120 dB
 - In the world of computing, most bytes are eight bits
 - 256 discrete levels provides 48 dB – not enough
 - 16 bit bytes provide 96 dB – 65,536 discrete levels

- What determines file quality and size?
 - Compression Ratio
 - Uncompressed audio is best, but files are relatively large
 - In the early pre-streaming days of the WWW, audio files compression ratios ranged from 3:1 to 8:1
 - Uncompressed – 10 Mb for one minute of stereo
 - Back to compression – mp3

- Nyquist Theorem
 - Nyquist Theorem – like so many other things, a product of Bell Labs
 - Sampling Rate must be at least twice the frequency range of the sampled content
 - Thus, a 44.1k sampling rate will convey a frequency range of 0-22,500 Hz
 - If the frequency range exceeds is over half of the sampling rate, aliasing will occur – strange audio artifacts

- Some Important Terms
 - Clipping – exceeding the capabilities of the circuitry – the result is noise, or distortion
 - Signal to noise ratio – keep it as high as possible – may be expressed as a ratio, but may be expressed in decibels
 - Normalizing – raising the level of the signal to its maximum before clipping, or some fraction of that

- Common file formats for uncompressed audio – Audio Interchange File Format (aif), Waveform Audio File Format (wav), Sound Design II (sd2)
- Hallmarks of Hard Disk Recording
 - Linear vs. non-linear editing
 - Non-destructive editing
 - Instantaneous editing
 - Repetition without duplication
 - Disk capacity can be an issue
 - Region – a highlighted section of audio in a
 - Soundbite – visual representation of an audio file
 - Playlist