Terms for Quiz #2

Digital Representation of Sound

Analog versus Digital (Late 1970s)

Analog-groove cut in wax cylinder

Digital-describes sound in terms of numbers (if not a number then not recognized-no noise)

Digital-snapshots or samples-numeric code assigned to each-pulse

PCM-pulse code modulation-digital representation of sound

Sampling rates: 44.1, 48kHz, 96 and 192

Nyquist theorem-if we want 20kHz then we need to sample at 40kHz

Bit depth or bit rate resolution-or quantization:

8-256 permutations about 46db dynamic range

16-65536 permutations about 96db dynamic range

24-16,777,216 permutations

32-4,294,967,296

Aliasing-to low of a sampling rate creates random pitches.

Error detection-drop out from magnetic tape is corrected by averaging data

Anti aliasing-filters out frequencies it can’t sample

Overload-digital recorders cannot handle overloads.

Some devices therefore, have Limiters

Dither-changing from 24 bit to 16, reduces resolution

RAM

Linear recording - tape decks

Non-linear or random-access - digital hard disk recording

Non-destructive - rearrange segments after they have been recorded

AAD, ADD, DDD

File formats

* **.aif** or**AIFF** (Audio Interchange File Format), the gold standard of 16-bit audio, travels well between almost all computers and software, includes header information like file name, sampling rate, MIDI note number for samplers, loop points, number of bytes in file. Also capable of 24-bit and 32-bit resolution. Has the capability for sourround
* **.aifc** or **AIFC** or AIFF-C compressed version of AIFF—does not have to be compressed, supports both Big Endian, popular with SGI computers.
* **.sd2** or **SD II** Sound Designer II—same as AIFF with added proprietary information such as markers and regions—still very popular on Macs, even though Sound Designer is defunct. WARNING: not portable to non-Mac computers.
* **.mp3** MPEG I-audio layer 3 compression—The beauty of MP3 is it's size. Would you want to master your music on MP3––no, but at least you can listen to it while you're jogging.
* **.ra** or**.ram** Real Audio—can be streamed on the Internet from a Real Audio server, so sound starts playing before file fully downloaded.
* **.wav** or Microsoft **WAVE** Designed for PCs and Windows, but now usable with most audio programs, Mac or PC. Similar to AIFF for bit-depth and sample rates. As mentioned above.
* **WMA** or **Windows Media Audio** designed for use with Window Media Player with various compression ratios.
* **.sf** (IRCAM)

