Glossary for Digital Oral History

Several Web sites include good glossaries and detailed explanations of terms used in digital recording and digitization. See, for example, the glossary provided on the Sweetwater *inSync* Web site at http://www.sweetwater.com/insync/word.php; Sandy Lerner's *The Dilettante's Dictionary: Audio Terminology in these Digital Days*, http://www.dilettantesdictionary.org/index.php; and Recording Institute of Detroit, *Audio Recording Terms Glossary*, http://www.recordingeq.com/reflib.html.

The glossary entries below have been compiled and adapted (by Tony Tadey, Elinor Mazé, and Rick Fair) from several sources, including Bill Walker's "Digitizing Analog Audio Resources: A Short Glossary of Audio Digitization Terminology," for Amigos Library Services, and David Miles Huber and Robert E. Runstein's *Modern Recording Techniques*, 6th edition, available online at http://www.modrec.com/glossary/.

AES (Audio Engineering Society): the leading professional association worldwide for professionals involved in the audio industry. http://www.aes.org

AIFF (Audio Interchange File Format): the standard digital audio file format for Macintosh developed by Apple Computer; comparable to the WAV format used for PCs.

Amplitude: the relative strength (loudness) of a sound regardless of its frequency (pitch) measured in decibels (dB).

Analog: signals (such a sound waves) that exhibit a continuous waveform, as opposed to digitized signals, which are sampled, or measured, at specified intervals and the samples represented by sets of binary digits.

Analog Playback Device: a device that plays back analog sound recordings. Examples include turntables for vinyl LP records and cassette and open-reel tape players and recorders.

Analog-to-Digital Converter: a device that renders an incoming waveform into a machine-readable file through a process called sampling. Example: a computer sound card.

ASCAP (American Society of Composers, Authors and Publishers): a membership organization that "protects the rights of its members by licensing and distributing royalties for the non-dramatic public performances of their copyrighted works." http://www.ascap.com/

Audio: any signal, sound, waveform, etc., that can be heard, as opposed to subsonic or ultrasonic sound, radio-frequency signals, or video signals.

Bidirectional (Figure 8) Microphone: a microphone with a pickup pattern that will accept sound from the front and back of the diaphragm. Frequency response is similar to an omni microphone, especially when the sound source is not too close to the microphone.

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BMI (Broadcast Music Incorporated): a membership organization similar to ASCAP that protects the copyrighted works of its members by licensing and distributing royalties for performances of their works. http://www.bmi.com/

Broadcast Wave Format (BWF or BWAV): an extension of the WAVE audio format developed by Microsoft and IBM; the recording format of most file-based non-linear digital recorders. First specified by the European Broadcasting Union in 1997 and updated in 2001 and 2003, it is also the file format recommended by IASA for storing archival audio files used in reformatting projects. (Adapted from Wikipedia http://en.wikipedia.org/wiki/Broadcast_Wave_Format)

Cardioid pickup pattern: A unidirectional microphone polar pickup pattern, so called because its shape resembles a rounded heart shape.

Clipping: a distortion of sound caused by cutting off the peaks of audio signals, usually caused by boosting the input signal to a level too high for the system to handle.

Condenser microphone: A microphone which has a diaphragm consisting of a stationary plate and a loosely suspended plate. One of the plates is fed by a supply voltage. Sound pressure causes the distance and capacitance between the two plates to change, producing the output voltage. Condenser microphones need a supply voltage to operate. Phantom power — power provided by the recording device to which the microphone is connected — is usually used. Condenser microphones are also often powered by their own batteries. Due to the design and construction, most condenser microphones generate less self-noise and are able to record sound sources from various distances well. This makes them ideal for oral history recordings during which an interviewee may move around or when one microphone must be used to record multiple people. However, in a controlled situation with proper positioning, a dynamic microphone can produce great results.

Decibel (dB): a unit of measurement used to indicate the loudness of a sound. Technically, a decibel is a comparison of two sound measurements expressed as a logarithmic ratio.

Digital-to-Analog Converter: a device that converts a digital audio signal to analog for playback. Examples: CD players, computer sound cards, MP3 players.

Digitization: the rendering of an analog resource to a format readable or playable by means of a computer.

Distortion: 1. a measure of unwanted noise in a signal. Distortion can skew, flatten, spike or otherwise change the audio wave, which changes the sound. 2. A sound modulation technique whereby the original waveform is distorted intentionally.

Dynamic microphone: a microphone which has a diaphragm attached to a coil of wire surrounded by a magnet. As sound pressure moves the diaphragm and attached wire, an output voltage is produced. Most dynamic microphones do not require phantom or battery power to function properly.

Equalization: a term referring to the characteristic or adjustment of specific frequencies. Equalization is commonly used in creation of access audio files (as opposed to preservation or archive files). It may be used to remove noise from a recording to make the intended content more intelligible. Removal of fan noise, machine hum, and low-end rumble are common.

EUB (European Broadcast Union): world's largest association of national broadcasters; develops standards and technical specifications for audio and video recording, broadcast, and preservation. http://www.ebu.ch/

Feedback: a sometimes unwanted occurrence in which the output of a circuit travels back through the input of a circuit. In audio equipment (analog and digital) this usually results in an unwanted sound that grows in intensity until clipping occurs; sometimes referred to as *fold back* or *howl around*. If the speaker on a recorder is reproducing the output of a microphone, the microphone will feedback if it picks up what the speaker is outputting again. On the Marantz PMD 660, for example, the built-in speaker must be turned all the way down when recording with an external microphone, or feedback will occur and spoil the recording.

Frequency response: the way in which an audio device such as a microphone responds to different frequencies of sound. Audio devices such as microphones may, intentionally or not, amplify low-frequency sounds (low notes) and weaken high-frequency sounds (high notes). For recording speech, a microphone with a **flat frequency response** is widely considered desirable, as it can produce the most accurate, natural-sounding recording.

Gain: a term used to reflect the adjustment (raising or lowering) of an electric level. Usually refers to the first or last level change in a device's signal flow (input gain /output gain). When we set the level of a microphone preamp to make sure the level is as loud as it can be without causing distortion, we are adjusting the gain. We do the same when we adjust the playback level of a tape deck as it feeds input to an analog-to-digital converter.

Hertz (Hz): a unit of frequency used to measure cycles per second; used to measure frequencies of sound or pitches. Examples: 440 Hz = the pitch "A" above middle C. Highest frequency heard by the average human is 20,000 Hz (20 kHz).

Hiss: audio noise that sounds like air escaping from a small aperture. Tape hiss is a noise that is inherent in analog tape formats. It is dependent on the formula used to make the tape. A few steps can be taken to limit tape hiss. While recording to tape, make sure your machine is clean and well calibrated, and record your signal at good high levels (without distortion). If you have a recording with a lower signal level, when you raise the level of the signal during playback, you will also be raising the level of hiss. During playback, in addition to making sure your machine is clean and well calibrated, make sure you are using the correct playback head. For example, on a quarter-inch playback machine, if a half-track head is used on ¼-track recorded tape, part of the playback head will be covering an area of the tape that may have not been recorded. This may cause your output to have a higher level of tape hiss.

IASA (International Association of Sound and Audiovisual Archives): an organization established in 1969 to encourage international cooperation in preserving audio and audiovisual documents. http://www.iasa-web.org/

KHz: thousands of cycles (Hertz or Hz) per second.

MIDI (Musical Instrument Digital Interface): A specification for the types of signals that can be transferred between various electronic devices or computers.

Mixing board: a device that takes the sound produced by multiple devices, players, or singers and mixes them into one sound signal. Mixing boards might be used in oral history recording for mixing multiple sources together for stereo or mono recordings. Occasions where a mixing board may be useful include panel discussion, interviews with more than one person, or recordings where there is both spoken work and music. Mixing boards are also common in documentary recording to add ambient noise.

MP3 (MPEG audio layer 3): the most commonly used standard for compressed audio files. MP3 uses perceptual audio coding to eliminate redundant and irrelevant parts of the sound signal to compress the file. The degree of compression is adjustable by the user: more compression degrades sound quality but decreases file size; less compression retains audio quality but increases file size. Note that "redundant" and "irrelevant" are terms disputed by audio archivists and others concerned with the complete, accurate, and long-lived reproduction of sound.

Noise: 1. sound containing all of the frequencies hearable by humans. 2. an unwanted sound not related to the wanted sound.

Noise reduction: 1. the use of filters to reduce unwanted sounds such as hiss and rumble. 2. the technologies employed by Dolby and DBX to reduce unwanted sounds during recording.

Normalize: to boost a waveform or sample in a digital system to the highest amplitude allowed by the system without clipping.

Nyquist Theorem: the theorem that states that a sound must be sampled at a minimum of twice its analog frequency in order to be accurately rendered in a digital environment.

Omni pickup pattern: a non-directional microphone pickup pattern. The microphone will pick up sound from all directions evenly.

Phantom power: a voltage applied evenly to both sides of a balanced line (even relative to ground). This inaudible voltage can be sent down a microphone cable to supply the voltage needed for a condenser microphone to function properly. The voltage is commonly +48 volts (relative to ground).

Pulse Code Modulation (PCM): a term for sampling as it relates to audio; any method of digitally encoding and decoding the amplitude of an audio signal.

Reformatting: the process of copying a sound recording to a newer storage medium to avoid loss of the recording due to deterioration of the medium on which it is stored.

Rumble: a low-frequency sound caused by the mechanical vibration of a turntable playing a record, noise within a microphone, or tape crossing over the heads of a player or recorder.

Sampling: The process of encoding an analog signal in digital form by reading (sampling) its level at precisely spaced intervals of time. Also called Pulse Code Modulation or PCM.

Sticky-shed/Sticky tape: a syndrome whereby water breaks down the binder polymers of magnetic recording tape. The result is that the tape sticks to the heads of the playback device, causing a squealing sound. This syndrome can render tapes unplayable.

Sound card: a circuit board installed inside a computer that enables digital audio playback, wave table synthesizing, and MIDI recording and playback.

Streaming: transferring data in a way that allows it to be processed as a steady and continuous stream; often used in Web presentation of audio and video recordings.

Tape hiss: noise produced by the movement of analog tape across the heads of a tape recorder/player; caused by changes in the random placement of magnetic particles on the tape.

VU meter: a device that measures analog sound converted to electrical impulses in units called volts. These meters are commonly found on tape recorders and mixing boards. Some VU meters use light-emitting diodes (LEDs) to indicate voltage; others use analog needles. VU meters (analog meters common on many tape decks) show an average or RMS level. This gives us a better idea of what the average energy of a recording is. Peak meters (more common in digital equipment and in newer analog equipment built in the digital age) show the instantaneous peak of a signal. This is necessary in digital recordings to show where information above the highest digital point is lost. Many people find VU meters more useful in analog recordings where the format has somewhat of a built-in compression as the upper limits of the range of the format are reached. A VU meter will overlook quick transients of signal (such as P plosives) and show the level of the majority of the content. What meter works best for you depends on your style of recording.

WAV (.wav): Audio file format developed by Microsoft and IBM for use on PCs. Although technically proprietary, it is widely used for storing raw, uncompressed audio files for computer access.