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GLOSSARY OF AUDIO TERMS

Learning about a new technology brings a new vocabulary that must be understood if one is to become a master student. As you study this material, referring back to the glossary may provide that missing link that will make your understanding complete.

This Glossary of Terms has been compiled for the benefit of the non-technical person. Definitions have been given to help communicate information that is useful and can be applied to everyday situations. At times, technical completeness and accuracy may be sacrificed for the sake of clarity to the novice.

A-B TEST:
A direct comparison of sound quality usually between two components, but sometimes more. This process is accomplished by switching from one component to another.

ABSORPTION:
The retention of all or part of one medium within another medium. In acoustics, sound can be absorbed partially by an insulating material. Absorption is measured in sabins: one sabin is equal to the sound retained by a one square foot space through which sound passes and never returns. A one foot square open window is an example of 100% sound absorption, since no sound is reflected back and is equivalent to one sabin of absorption (also known as one OWU or open window unit).

ABSORPTION COEFFICIENT:
A numerical value which indicates the degree to which a particular material will absorb sound energy. A coefficient of 1.0 indicates that there is 100% absorption while a coefficient of .01 indicates almost 100% reflection. Absorption coefficients are sometimes specified for a specific frequency.

AC:
An abbreviation for Alternating Current. This is an electrical signal which alternately changes its charge from positive to negative. The rate of change or number of complete cycles in one sound of time is called its frequency. AC is the most common form of wall current in homes as contrasted to DC (direct current). In the US the frequency is 60 Hz (60 changes or cycles per second).

ACOUSTIC FEEDBACK:
An undesired frequency or combination of frequencies which become noticeable whenever sound that has been amplified through the sound system re-enters a microphone in the same system and is amplified again. Feedback can be controlled by proper microphone and speaker placement, use of high quality components and tuning or equalizing the system, but it can never be eliminated. It will always be the limiting factor as to how loud the system can be operated.

ACOUSTIC POWER OUTPUT:
The total acoustic energy produced by a second transducer such as a speaker or horn. The output is referred to as acoustic watts.

ACOUSTIVOICING:
Equalization process developed through Altec Lansing to help reduce feedback and create more natural sound to the listener. "Equalization" or "room tuning" are other names for this process.

ACTIVE DEVICES:
Components that function through the use of electronic circuits that require power to operate, as compared to passive devices which do not require power to activate that device's circuit.

AFC:
An abbreviation for Automatic Frequency Control. A system which automatically keeps a circuit tuned to a signal's specific frequency.

AGC: See AUTOMATIC GAIN CONTROL

ALC: See AUTOMATIC GAIN CONTROL

ALIGNMENT:
1. The adjustment of tape recorder heads in relationship to the tape path for best recording and play back. 2. The physical placement of high and low frequency speakers that assures proper phase relationships when sound is emitted from both speakers.

ALTERNATING CURRENT: See AC.

AM:
An abbreviation for Amplitude Modulation. A form of radio transmission which entails the process of superimposing AC, or an audio signal on a pure sine wave in such a way that the audio signal changes the amplitude (level) of the pure sine wave.

AMBIENT NOISE LEVEL:
Noise within an area which can partially or completely mask the desired sound from the speaker system. This could be a noisy audience, a heater or air conditioner, water coolers, lighting, street noise, etc.

AMPERE (AMP):
The unit of measure representing the flow of electrical current. One ampere flows through one ohm of resistance when a potential of one volt is applied. The relationship can be expressed as I(amps) = E(volts)/R(ohms).

AMPLIFIER:
Any circuit or instrument which strengthens or boosts a signal's amplitude.

AMPLITUDE:
The "level" or "volume" of an electrical or acoustical signal.

AMPLITUDE MODULATION: See AM.

ANALOG:
An electronic signal whose waveform resembles the waveform of the original sound.

ANALYZER:
A piece of test equipment which senses a sound or signal and provides an evaluation or display of that signal. (Also, see REAL TIME ANALYZER, TDS, AND TEF.)

ANECHOIC:
The property of an enclosure or surface that completely absorbs sound. No reflected sound of any significance is present.

ANTENNA:
Any device which either receives or transmits radio signals. An antenna simply may be a rod or wire or a very complicated apparatus.

ARTICULATION LOSS (%-Alcons):
A measurement expressed as a percentage that indicates the degree to which spoken consonants are heard incorrectly by the listener.

ASCII:
An acronym which stands for American Standard Code for Information Interchange and represents a standard computer character code.

ATTACK TIME:
The time required for a device to respond to a signal.

ATTENUATE:
To decrease levels as with a volume control, attenuator, or pad.

ATTENUATOR:
Any device designed to reduce or attenuate the strength of a signal.

AUDIO FREQUENCY:
A frequency, tone or pitch which is audible within the frequency range of 20 Hz to 20,000 Hz.

AUTOMATIC GAIN CONTROL (AGC):
A circuit that maintains a constant output level regardless of how the input varies. Also referred to as ALC or Automatic Level Control.

AWG:
An abbreviation for American Wire Gauge which is the standard for measuring and delineating cable diameter in the United States. The smaller the gauge number, the larger the cable conductor diameter.

AXIS:
An imaginary line superimposed upon a microphone or speaker which defines the radiation or pick up pattern. As related to a microphone, it refers to a line entering through the head of the mike and leaving at the conductor end. Signals directed along this line toward the front of the microphone are "on-axis". All other signals approaching the mike are said to be "off-axis".

AZIMUTH:

The angle between the magnetic tape head and the longitudinal axis of the tape.

BAFFLE:
A shielding structure or partition used to isolate or direct the path of a sound. In essence, a baffle increases the effective length of the transmission path from the sound source to another point by causing sound which would usually wrap around the device and be lost in the opposite direction to be reflected forward and then combined with the already forward directed sound.

BALANCED LINE:
A method for wiring microphone cable or some patch cord which contains two ungrounded conductors and a shield. Its purpose is to reduce potential radio frequency interference or AC hum which can enter the sound system through the cables. Both conductors carry the same signal that is equal in magnitude and opposite in polarity (180 degrees out-of-phase) with respect to ground.

BANDWIDTH:
The range of frequencies from the lowest to the highest which makes up an audio signal.

BASS:
The lowest frequency range that can be perceived by the human ear. Commonly considered to be from 20 Hz to approximately 200 Hz.

BASS BOOST: See PROXIMITY EFFECT

BASS REFLEX:
A speaker enclosure whose front is "ported" that allows sound energy from the rear of the speaker cone to exit the cabinet in such a way that it is "in phase" with the sound coming from the front of the cone.

BEL:
A unit of measurement used for comparing magnitudes. A more commonly used form is the decibel (dB), which is 1/10th of a Bel. (Also see dB.)

BI-AMPLIFICATION:
An amplification system in which the original signal is divided into two independent signals - one being considered high frequency and the other low frequency. These two signals are then fed into separate amplifiers which respectively power high frequency drivers and low frequency drivers.

BIAS:
The electrical, mechanical, or magnetic force applied to a device for the purpose of establishing an electrical or mechanical reference level for the operation of that device.

BI-DIRECTIONAL MICROPHONE:
A microphone that receives sound from two directions that are 180 degrees apart. This pickup pattern is often called a "figure 8" pattern.

BINAURAL SOUND:

A type of microphone technique. The sound is recorded using two channels and two microphones or microphone elements that have been placed in a relationship similar to that which is found between the listener's ears. Often the microphones are positioned in the ears of a dummy head to approximate normal hearing.

BNC:
An abbreviation for "Bayonet Neill-Concelman," the inventor of this type of connector often found on test equipment.

BOOM:
A support for a microphone or light which is supported by a vertical microphone stand or by hand.

BRIDGE INPUT:
An input with such a high impedance that another device's output can be connected to that input without affecting the output device's volume.

BULK ERASER:
A device, usually a powerful electromagnet designed for high-speed erasing of magnetic storage material like audio or video tape.

BUS (on a mixer):
A combining location in an electrical circuit where individual signals are brought together to form one composite signal.

BUZZ:
An unwanted noise in a sound system usually caused by improper grounding techniques, low quality lighting dimmer, or improper impedance matching in the signal's path.

CANCELLATION:
Attenuation that occurs when two signals of opposite polarity are combined. Cancellation will also occur, but to a lesser degree when signals of non-identical phase are combined. Cancellation of these types can occur electrically or acoustically.

CAPACITANCE:
Measured in microfarads (MF), it is an indicator of a component's ability to store an electric charge.

CAPSTAN:
The tape recorder drive spindle that controls the record and playback speed of a tape transport.

CARDIOID:
A microphone pickup pattern that is more sensitive to sound coming from the front, "on-axis" position than the back or sides. The name "cardioid" comes from the heart-shaped figure that results when the pickup pattern is plotted on a graph. This type of pattern is also known as unidirectional.

CARTRIDGE:
1. The portion of a microphone containing the diaphragm and other parts of the microphone. 2. A pickup on a turntable used for reproducing the sound stored on records.

CASSETTE:
An enclosed and somewhat dust proof container holding a single reel of tape or film with one end connected to a supply reel and the other to a take-up reel.

CASCADING:
The act of arranging two or more similar mixer circuits or amplifiers in such a way that the output of one stage directly feeds the input of the next.

CENTRAL CLUSTER:
A centrally located group of speakers positioned in a manner that helps orient and maintain the illusion that the amplified sound is coming from the same direction as the original source.

CLICK TRACK:
A separate channel or track on a recording tape containing clicks in sync with the tempo of music recorded on adjacent tracks. It is often used by conductors or instrumentalists who are expected to play along with previously recorded music.

CLIPPING:
When the amplitude of a signal is greater than what a circuit can handle, the signal peaks are cut off at the ceiling level of the circuit. Severe clipping can be heard as distortion.

COAXIAL CABLE:
A cable with an insulated central conductor that is surrounded with a concentric "tube" of screening or shielding wires which are not insulated.

COINCIDENT PAIR:
A microphone arrangement for stereo recording in which the microphones are place adjacent to each other with their axis 90 degrees apart. Sometimes referred to as X-Y miking.

COLORATION:
A phenomenon which occurs when the original signal is altered or changed, either electrically or acoustically. Coloration is a form of distortion which may or may not be desirable.

COMPANDER:
A dual function signal device which compresses and expands a signal.

COMPLIMITER:
A dual function device containing a compressor and a limiter.

COMPRESSOR:
A device that will reduce the dynamic range of a signal as that signal rises above a specifically determined threshold. A compressor is similar to a limiter, but is less severe in its signal reduction. Some compressors will also amplify the softest part of a weak signal.

CONDENSER MICROPHONE:
A microphone which needs an electric charge on the conducting surfaces of its pickup element. In order to function, a condenser microphone requires an internal battery or an external power supply as its form of power. (Also see Phantom Power.)

CONDUCTOR:

Any metal that allows the flow of electrons. Some metals work better as conductors than others in audio circuits. Gold or copper are preferred to aluminum or lead conductors.

CONE:
The portion of a speaker which is usually made out of a stiff paper and is physically connected to the voice coil. As the voice coil moves in and out, the cone starts air in motion to create a sound wave that can be heard.

CONTACT MICROPHONE:
A microphone designed to pick up sound vibrations that are transmitted through a solid material to which the mike is attached, rather than from vibrations traveling through air.

CPS:
An abbreviation for Cycles Per Second. This is the number of back and forth (plus and minus) vibrations of an alternating current in one second. CPS is now commonly replaced by the term "Hertz" (Hz).

CRITICAL DISTANCE:
A point at which the sound pressure level (SPL) radiating directly from the speaker is the same volume as the reflected sound field. As you move away from a sound source, you will notice that the sound drops off in volume at a consistent rate. Once the critical distance has been reached, the sound volume will not decrease with additional distance from the sound source.

CROSS FADE:
A slow mix or transition between two audio signals during which both sources temporarily overlap.

CROSSOVER NETWORK:
A circuit for dividing the audio spectrum into two or more frequency ranges before feeding the signals to separate specialized components or speakers such as woofer, mid-range and tweeter. Sometimes the crossover network is placed before the amplifier at which time it is called "low power crossover." These divided signals are independently fed to their own amplifiers and on to the respective speakers.

CROSSTALK:
Signal or sound leakage between two channels, cables, or components.

CUE TRACK:
An audio track on recording tape on which a special signal is recorded which triggers or activates another electronic device or event.

CURRENT:
The flow of electrons within a conducting medium.

CUT-OFF:
A point where the signal is stopped either by frequency or by voltage level. Voltage level cut-off would be an example of a limiting type of circuit. Frequency cut-off is often a filter needed to eliminate or reduce a specified frequency.

CYCLES PER SECOND: See CPS.

dB:
An abbreviation for decibel. The unit of measurement chosen to indicate an amount of change in level of voltage, current, power, or sound. When measuring the loudness of a sound system to a listener, zero dB-SPL is the lowest volume the human ear can detect. All levels above that point would be considered +1, +2, +5, +20, etc., dB-SPL.

dBm:
An abbreviation for decibels referenced as a ratio to one milliwatt.

dBv:
An abbreviation for the increase or decrease of voltage regardless of the impedance.

dBW:
An abbreviation using one watt as the reference for decibels.

dBx NOISE REDUCTION:
A type of noise reduction system that expands the audio signal to mask or overpower the unwanted noise and then compresses the signal back to its original volume.

DC:
An abbreviation for Direct Current. The flow of an electric current in one direction only and at a substantially constant value. Direct current will have a constant amplitude when referenced to sound.

DEAD ROOM (acoustically):
A room that has an RT-60 that is less than one second.

DECIBEL: See dB.

DEGAUSSER:
A device designed to reduce residual magnetism such as the record head of a tape recorder. To degauss a recording tape is to erase the signal previously recorded.

DELAY:
A device than can momentarily stop the audio signal for a predetermined amount of time, generally measured in milliseconds or microseconds and is often employed to help maintain source orientation or time relationships in speaker systems.

DIAPHRAGM:
A device which is used to convert one form of energy into another. 1. In a microphone it is the element which changes acoustical energy into electrical energy. When sound energy strikes the diaphragm and causes it to move, this movement creates an electrical signal which is eventually passed through the microphone cable. 2. In a speaker it is the moving element that vibrates when AC current is applied to it from the amplifier. This process changes electrical energy into acoustic energy.

DIFFERENTIAL AMPLIFIER:
An amplifier having two identical sections, each having separate inputs but a common ground. Two separate outputs or an output in common to both are provided.

DIGITAL:
Signals arranged in the form of a series of coded pulses. "ANALOG" is contrasted to "DIGITAL."

DIMMER HASH:
A very rapid clicking sound created by electronic dimmer systems heard in the sound system as buzz or noise.

DIN:
An acronym for Deutscher Industrie Normenausshus (German Industrial Work Standard), a German standards organization.

DIPOLE ANTENNA:
A center-fed aerial consisting of a single wire which is a half-wavelength long (in relation to its operating frequency). Examples of dipole antennas are the "T"-shaped wires with FM tuners and TV rabbit ears.

DIRECTIVITY:
A microphone's area of sensitivity or the angles of sound coverage from a speaker.

DISPERSION ANGLE:
The angles through which a speaker disperses the acoustical power (sound) into the listening area. Most speakers are rated so that at the published outside limit of the dispersion angle, the volume is 6 dB lower than at the center (on-axis) point for the same distance from the speaker.

DISTORTION:
Any difference between the original signal and the signal produced by a sound system, a circuit, or a signal that was stored on recording tape. The human ear has difficulty detecting less than 6% distortion on three-note musical passages, and less than 3% distortion on a single pitch.

DOLBY NOISE REDUCTION:
A noise reduction system that mainly reduces high frequency hiss on tapes. The "A" type is for professional use which is often used in recording studios and the "B" type is lower cost for home cassette recording and FM broadcasts. A more effective "C" system is also used in home and semi-professional equipment.

DOPPLER EFFECT:
The perceived change in pitch as a result of a moving sound source as heard by a stationary listener or vice versa. If both the source and listener were either stationary or moving then there would be no change in pitch.

DOWNSTAGE:
The performing area nearest the audience or camera. Opposite of UPSTAGE.

DRIVER:
A transducer (speaker) which changes electrical energy into acoustical energy for a listener to hear.

DROPOUT:
A phenomenon which occurs with wireless transmission devices or on recording tape. With wireless systems the transmitted signal is momentarily lost by the receiving device. This is caused by the direct radio signal being cancelled at the receiver by an out-of-phase reflected radio signal. With recording tape the oxide has been worn off and the signal cannot be recorded onto the tape. A dropout will show up during playback as an absence of sound, the duration of which can be very short and barely noticeable, or very long and obvious.

DRY SOUND:
Direct sound which does not contain any added reverberation, echo or other delayed sounds.

DUMMY LOAD:
An equivalent electrical termination on a piece of equipment which is generally used in testing, as opposed to actually connecting the normal or intended device to the unit under test.

DYNAMIC MICROPHONE:
A type of microphone with an electromagnetic capsule that employs a moving coil diaphragm in a magnetic field. It is known as a "moving-coil microphone." This is the most rugged and common microphone used for music and general speech applications.

DYNAMIC RANGE:
The difference between the loudest and softest sound within the program material, which is above the inherent noise level of the recording medium or listening environment.

EARTH: See GROUND.

ECHO:
A sound wave that has been reflected with sufficient volume and delay so that it can be detected by the ear as a separate sound that is distinguishable from the original.

ECHO CHAMBER:
A room designed to create echoes of an original dry sound. These echoes are then combined with the original sound to create special effects.

EDITING:
A process that allows the selection or deletion of various signal sources on audio tape or other recording mediums.

EFFICIENCY:
The transducer's ability to convert electrical energy into acoustical energy at a given volume level. This measurement can be used to compare one speaker to another.

ELECTRET MICROPHONE:
A condenser microphone employing a capacitor-type diaphragm that has been pre-charged by the manufacturer. As with other forms of condenser microphones, an electret requires a power source whether an internal battery or external power supply to make it work. (Also see Condenser Microphone and Phantom Power.)

ELECTROMAGNETIC:

Combined electric and magnetic fields associated with the movement of electrons. Shielding is a method of reducing the effects of electromagnetic fields on a cable.

ELECTROMOTIVE FORCE:
Electrical pressure that causes electrons to flow through a conductor.

ELECTROSTATIC:
Static electricity or electricity at rest.

ENCLOSURE (speaker):
A box which houses one or more drivers. Such a cabinet enhances the sound produced and controls the sound's dispersion.

EQUALIZATION:
Adjustment of specific frequency groups (which are too high or low) by the use of filters or electronic circuitry known as equalizers. Equalization is used to compensate for inaccuracies in system components and a building's acoustical nature. It is most appropriately used to interface a speaker system to the acoustics of the room in which it was installed. It can also be used to reduce (but not eliminate) feedback.

EQUALIZER:
A component used in the equalization process which has multiple controls for adjusting specific sections of the frequency spectrum. Such a device is particularly useful for matching a sound system to a room's acoustics as well as for reducing feedback.

ETC:
Energy Time Curve.

EXPANDER:
A device for increasing or restoring the dynamic range of a program signal.

FADER:
The control on a mixer that increases or decreases the volume of program material. A slider type of volume control.

FEEDBACK: See ACOUSTIC FEEDBACK.

FILTER:
A circuit which amplifies or attenuates the volume of selected frequencies. These circuits are often incorporated in sound reinforcement consoles as feedback controls and tone controls. (Also see EQUALIZER, HIGH PASS FILTER, LOW PASS FILTER.)

FLAT RESPONSE:
An indication of a component's ability to transfer a signal from its input to its output without changing the original signal's amplitude or volume. Any variation from a flat response is indicated in dB above (+) or below (-) the reference level.

FLETCHER-MUNSON CURVES:

Charts which show the average hearing responses of people at different volume levels as related to various frequencies.

FLUTTER (tape):
A phenomenon caused by a fluctuation in the signal on or from a tape as a result of inconsistent tape speed across the heads. Flutter is most likely to affect high frequencies. (Also see WOW.)

FLUTTER ECHO:
An echo with a very high repetition rate, usually caused by sound bounding between two hard, reflective, parallel surfaces.

FM:
An abbreviation for Frequency Modulation. A method of signal transmission by means of varying the frequency of the carrier voltage. See AM.

FOLDBACK:
An on-stage monitor speaker or the signal fed back to such a speaker. (Also see MONITOR.)

FREQUENCY:
The number of sound vibrations per second or the number of complete cycles per second of an electrical wave. The frequency is a number indicating the cycles-per-second called "Hertz," and determines the pitch of a tone. Low frequency refers to bass tones and high frequency to treble tones. SEE CPS and Hertz.

FREQUENCY ANALYZER:
An instrument which listens to sound, separates it into segmented parts (frequencies) and indicates their individual volumes relative to each other.

FREQUENCY MODULATION: See FM.

FREQUENCY RESPONSE:
The way an electronic component like a microphone, amplifier, or speaker, responds to signals composed of various frequencies. A flat frequency response shows that the component will reproduce all frequencies exactly as it receives them without colouration.

FUNDAMENTAL:
The basic pitch of a musical note. A sine wave vibrating at one frequency is the fundamental of that pitch. Musical instrument tones are comprised of the fundamental plus a number of overtones that determine the instruments characteristic timbre. "Harmonics" is a term which refers to the fundamental and its overtones. (Also see HARMONICS AND OVERTONES).

GAIN:
The increase in signal provided by an amplifier between its input and its output stages. Gain is usually described in dB of increase.

GATE: See NOISE GATE.

GRAPHIC EQUALIZER:

A particular type of equalization device which allows boosting or cutting of specific frequencies. Most equalizers have controls at either one-third, two-thirds, or one octave band frequency intervals.

GRILLE CLOTH:
A specially woven fabric with unusually transparent qualities or sound transmission. It is most often used as a covering for speakers.

GROUND:
A point in any electrical system that has a zero voltage and is usually the chassis of any electrical component or the shield of a microphone cable. A ground can also be a direct connection to "earth," the ultimate ground, and to which all electrical components should be connected.

GROUND LIFT:
An adaptor which does not permit the ground pin of an AC power cord plug to connect to the electrical ground in a wall outlet.

GROUND LOOP:
A hum in a sound system that results when there is more than one A.C. Ground used in the electrical power system.

GROUND POTENTIAL:
A state where 0 (zero) volts always exists. The potential of the earth as a reference point.

H-PAD:
An "H"-shaped attenuator placed in-line between the output of a component and the input of another to decrease the signal level by a specific level in dB.

HARMONIC DISTORTION:
Undesired harmonics which were not present in the original signal. Their presence is expressed as a percentage.

HARMONICS:
Frequencies which are multiples of a fundamental tone. A second harmonic is two times the frequency of the fundamental; a third harmonic is three times the frequency of the fundamental. Harmonics of the fundamental are also called overtones.

HARMONIZER:
An electronic device capable of raising and lowering pitch without altering the time aspects of the source. Also, a brand name for a pitch shifting device.

HEAD:
1. An audio device found in recorders and playback units that produces and/or reads narrow magnetic bands on tape. 2. A slang term used to refer to a mixer/amplifier combination.

HEAD ROOM:

The amount of dynamic range available above the normal working level of the system or component before overloading, distortion or clipping occurs. High quality sound systems are normally designed with 12 dB to 24 dB of head room.

HEAT SINK:
A metal structure which conducts heat away from heat-sensitive electronic components.

HEMISPHERICAL:
A pickup or output pattern similar to one-half of a ball.

HENRY:
A unit of inductance.

HERTZ (Hz):
The number of sound vibrations per second. (Also see CPS.)

HIGH CUT FILTER:
A circuit to remove undesired high frequencies from the program material. High cut filters are often found in phono preamplifiers and in sound system consoles for feedback control. They are sometimes referred to as a "low pass filter." (Also see LOW PASS FILTER.)

HIGH IMPEDANCE:
A rating of 10,000 ohms and up.

HIGH PASS FILTER:
A circuit often included in mixers or installed in the circuit prior to an amplifier which allows high frequencies to pass through, but blocks all frequencies below a certain point. Sometimes called a "low cut filter." (Also see LOW CUT FILTER.)

HORN:
A flared or funnel-shaped device usually used in conjunction with a driver that couples the signal to the air and points the sound in the direction it will travel. The overall size of the horn's opening is determined by the lowest frequency for which it is to control.

HYPERCARDIOID:
A pickup pattern that is more narrow than a standard cardioid microphone. A "shotgun mike" is an example of a hypercardioid pickup pattern.

IPS:
An abbreviation for Inches Per Second, the speed that tape travels as it passes by the head of a tape recorder. Common tape speeds are 1 7/8 IPS, 3 ¾ IPS, 7 ½ IPS and 15 IPS.

IMPEDANCE:
The force in an AC circuit that opposes the flow of current at a specific frequency. Impedance includes both resistance and reactance and is expressed in ohms or abbreviated with a Greek "omega" sign (☐).

INCHES PER SECOND: See IPS.

INDUCTANCE:

The force in an AC circuit that opposes the change in current flow as measured in Henrys.

INTERCOM:
A two-way communication device often used between sound and lighting technicians, stage directors, and conductors.

INPUT:
The receptacle or jack through which a signal is fed into a component or a system.

INPUT DISTORTION:
The distortion at the initial input circuitry of a component caused by an incoming signal that is too strong or has an improper impedance match. Input distortion, clipping, or overload can be controlled by adding an attenuator in the circuit prior to the distorting circuitry.

INPUT IMPEDANCE:
A load in ohms seen by a component at its input.

INSERTION LOSS:
The amount of amplitude reduction in a signal as a result of adding a piece of equipment to the signal path.

INSULATION:
A material that is used to separate conducting bodies by means of non-conductors to prevent transfer of electricity, heat, or sound.

INTERMODULATION DISTORTION:
A condition where a component creates a new signal at a different frequency as a result of non-linearity in a circuit.

INVERSE SQUARE LAW:
In the absence of all reflecting surfaces, sound pressure level will decrease inversely with the square of the distance from the source. It may be expressed as a 6 dB decrease every time the distance from the source is doubled.

JACK: (Audio)
A female audio receptacle for a male type connector called a plug.

JOYSTICK:
A slang word given for a lever which permits the relative placement of a MONO signal anywhere within the four quadrants of a four channel (Quad) sound output. (Also see PAN POT.)

JUNCTION:
A point in a circuit or system where two or more components or wires are connected together.

K:
An abbreviation for Kilo instructing the user to multiply the number by 1000. Example: 47K would be 47 times 1000 = 47,000.

L-PAD:

An "L"-shaped attenuator circuit that provides a constant impedance to the amplifier's output to which it is connected. An L-PAD is often used as a volume control for a speaker.

LAVALIER:
A microphone designed to be worn around the neck, or attached to a lapel, shirt, or tie.

LEADER TAPE:
Blank tape that is spliced into a reel of recording tape either before, between, and/or after individual selections.

LED:
An abbreviation for Light Emitting Diode often used as indicator lights on mixers and other components to indicate signal level or clipping.

LEDE:
An acronym for Live-End-Dead-End. Live-End-Dead-End is a model used to control perceived acoustics when designing control rooms in recording studios.

LIMITER:
A device used to set a maximum output level of program material by attenuating any peak levels that exceed a preset threshold. It is similar to a compressor, but much more drastic in its action when the threshold is reached.

LINE LEVEL:
A category of signals whose voltage is about .5 volts to 3 volts. The level of signal most commonly used between electronic audio components.

LINE MATCHING TRANSFORMER:
A device designed to change the impedance as seen by the output and input of two components. These are frequently used to match a high impedance microphone with a low impedance mixer input or vice versa.

LIP SYNC:
A process by which a vocal part appears to be sung while it is actually being played from an audio tape previously recorded for performance or video taping.

LIVE ROOM:
Any room with an RT-60 of two seconds or more.

LOADING:
The act of creating a specific impedance or load at the output of one device as it is connected to the input of another.

LOW CUT FILTER:
A circuit designed to remove undesirable low frequencies from the program material. Low cut filters are often found in phone preamplifiers and in sound system consoles for feedback control. (Also see HIGH PASS FILTER.)

LOW IMPEDANCE:
A rating of devices whose impedance's are less than 600 ohms.

LOW PASS FILTER:
A circuit that allows low frequencies to travel down a line, but blocks all frequencies above a certain point. (Also see HIGH CUT FILTER.)

MASK:
To partially or completely obscure one signal or sound with another one.

MASTER:
A first-generation recording.

MEG or MEGA (M):
A numerical prefix meaning multiply a specified number by 1,000,000. Example 50 Meg means 50 times 1,000,000 = 50,000,000.

MICRO (µ):
A numerical prefix meaning divide by 1,000,000. Example: 55 micro seconds = 55 divided by 1,000,000 = .000055 seconds.

MICROPHONICS:
Noise caused by mechanical vibration of the components within the system which is then picked up by an electronic circuit and reproduced through the system.

MICROWAVE:
Waves above one billion Hertz used to transmit television pictures or audio from one antenna to another.

MILLI (m):
A numerical prefix meaning divide by 1,000. Example: 75 milliseconds divided by 1,000 = .075 seconds.

MIXDOWN:
A recording process in which all of the tracks from a multi-track tape recorder are combined into a stereo tape or mono tape.

MIXER:
A preamplifier that accepts and combines several signals from sources such as microphones, instruments, tape recorders and phonographs. Normally, one volume control is assigned to each input source and the individual volumes are balanced accordingly. Then the individual signals are combined into one common signal and sent to the next component in the sound system.

MODULATION:
The process of varying one signal within another.

MONAURAL: See MONO

MONITOR:
1. A speaker that is pointed back at the performer so he/she can hear various types of signals such as pre-recorded tapes, instruments, or other vocalists. This speaker is sometimes called a

foldback speaker. 2. A speaker used in recording studios to allow the engineer, producer, or performer to hear specified signals as they are being recorded.

MONO:
A sound system where all the program material is combined into one signal. Several microphones, amplifiers, and/or speakers may be used, but only one sound is heard even when multiple speakers are used.

MOVING COIL:
A transducer, whose operation is based on the principle of sound vibration exciting a coil of fine wire suspended around or between two poles of a magnetic field. (Also see DYNAMIC MICROPHONE.)

MU-METAL:
A metal easily saturated by a magnetic field. Housings of Mu-metal are often used around transformers to isolate or shield delicate circuitry in electronic equipment from stray magnetic fields produced by the transformers.

NAB:
An abbreviation for National Association of Broadcasters. Very often the initials NAB are used in conjunction with specifications that denote standards established by this organization.

NICAD:
A short term for Nickel CADmium. A type of battery that may be recharged.

NOISE:
Any unwanted signal that is not part of the program material.

NOISE FLOOR:
The inherent level of noise that is part of the component or recording medium as a result of its design or quality of construction.

NOISE GATE:
A device which has zero output when the input falls below a preset level. When the signal level reaches the preset level, the gate opens and allows the signal through.

NOM:
An abbreviation for the Number of Open Microphones feeding into a sound system at any one time. As NOM is increased, gain before feedback is decreased.

NON-LINEAR:
Having an output that does not coincide with the input.

NOTCH FILTER:
A filter tuned to remove or reduce in level a very narrow frequency band.

OHM:
A measurement of the amount of impedance or resistance abbreviated by the Greek "omega" sign
(□).

OHM'S LAW:
The equation that shows the relationship between volts, ohms and amps. Applied voltage is always equal to the amperage times the resistance. E(volts) = I(amps) x R(ohms).

OMNIDIRECTIONAL:
A microphone that hears sound from all directions equally. There is no difference between on-axis and off-axis signals, frequency response, or level.

OSCILLOSCOPE:
A piece of test equipment that is able to display on a Cathode Ray Tube (CRT) the electrical picture of a wave form in the circuit being tested.

OUTPUT:
The signal coming from a component.

OUTPUT IMPEDANCE:
The impedance in ohms of a component as its output termination point. The load or input impedance should never be lower than the output impedance.

OVERDUB:
An additional instrumental, spoken, or sung part that is added to an already recorded passage.

OVERTONES:
All of sound's harmonics excluding the fundamental. (Also see HARMONICS, FUNDAMENTAL.)

PAD:
An attenuator or passive network designed to decrease the power level of a signal. (Also see ATTENUATOR.)

PAN:
To position a mono sound source somewhere in a multiple channel output panorama such as with stereo or quadrophonic. (Also see JOYSTICK AND PAN-POT.)

PAN-POT:
A device usually a rotary knob, designed to control the positioning of a mono source in a stereo panorama. (Also see JOYSTICK.)

PARABOLIC REFLECTOR:
A dish-shaped or concave shell designed to focus sound waves so that a microphone placed at the focus point inside the shell can pick them up more efficiently.

PARAMETRIC EQUALIZER:
An equalizer which allows a choice of frequency and bandwidth as well as the amount of boost or cut that can be imposed upon a signal.

PASSIVE DEVICES:
Components that do not amplify a signal. Passive devices most often cause a decrease in total signal level output due to their non-amplifying nature.

PATCH BAY:
A junction panel in a sound system which allows any output to be connected to any of several different inputs, usually by means of patch cords.

PATCH CORD:
A short cable with a plug on each end. Patch cords are used to interconnect the various components in the sound system. Some cables must be shielded depending on where they will be used in the system.

PAUSE CONTROL:
A switch on a tape recorder which temporarily stops the tape transport without shutting off the machine or changing the operating mode.

PEAK LIMITER:
A device that automatically limits the output signal at pre-set ceiling level without affecting the signal until it reaches that point.

PHANTOM POWER:
DC voltage that is fed to a condenser microphone from a mixer or special power supply through the mike cable. (Also see CONDENSER MICROPHONE.)

PHASE:
Two sound waves starting at the same time, increasing and decreasing together, and ending at the same time are said to be "in-phase". Cancellation occurs when two waves meet and are "out-of-phase". The amount of cancellation is determined by whether the waves are partially or completely out-of-phase. Phase is measured in degrees such that "in-phase" signals are zero degrees apart and totally out-of-phase signals would be 180 degrees apart.

PHASING:
A special effect which involves dividing an audio signal into two identical parts, delaying one of the signals and then recombining the two signals together. The result is phase cancellations at various frequencies dependent on the amount of delay. Varying the amount of delay between the two signals changes the frequencies where the cancellations occur. Phasing was originally done with two tape machines, but is now created electronically.

PINK NOISE:
All frequencies produced simultaneously and at equal energy per octave band.

PITCH:
The musical identification of the fundamental tone of a sound, as determined by its frequency. The A above middle C on a piano has a frequency of 440 Hz.

POLAR PATTERN:
A graph indicating the pickup pattern of a microphone or the dispersion pattern of a speaker.

POLARITY:
A term that refers to the relationship of the plus (+) and minus (-) signals in an audio component as compared to those of another component.

POP FILTER:

A wind or blast protector positioned around the diaphragm of a microphone to reduce "pops" in the sound system caused by certain letters such as "P"'s and "T"'s.

PORT:
A strategically placed and sized opening in the front of a loudspeaker's enclosure that allows internally reflected sound waves from the back side of a loudspeaker to project out through the front of the box.

POSTPRINT:
On recording tape, this is a signal that is often heard as a repeat or echo of a previous signal. Most commonly, a result of magnitude flux transferred from one tape winding to a later winding. Postprint is more acceptable to the ear than PREPRINT.

POWER AMPLIFIER:
An instrument or circuit which takes a line or auxilary level signal from a preamplifier in a mixer or tape recorder and amplifies it to a level where it can be heard through speakers.

POWER SUPPLY:
A device that supplies a specified voltage to a circuit or changes electrical energy from one form to another, such as AC voltage to DC voltage.

PREAMPLIFIER:
An instrument or circuit that takes a small signal from a microphone, musical instrument, etc., and amplifies it to the magnitude that can drive the input of a power amplifier.

PRE-EMPHASIS:
The first stage in a two-stage process of which the second stage is de-emphasis. Pre-emphasis usually refers to boosting or cutting certain frequencies in order to improve signal-to-noise ratios or distortion and is applied to the program signal just before transmission or recording. De-emphasis is necessary to put the signal back to its original condition before listening.

PREPRINT:
The phenomenon of hearing a "phantom" sound before the tape head or record player stylus gets to the actual main recording of that same signal. This happens on tape if the signal prints through from one winding to another.

PRESENCE:
An illusion of closeness to a sound source which can be created by boosting the frequency response of an audio circuit between 2kHz and 5kHz, or moving the microphone closer to the sound source.

PRIMARY WINDING:
The input side of a transformer.

PRINT-THROUGH
The leakage of a magnetic pattern, such as recorded music to an adjacent layer when tape is stored. (Also see PREPRINT AND POSTPRINT.)

PROXIMITY EFFECT:

An increased bass response that is directly related to how close a sound source gets to a unidirectional microphone. (Sometimes referred to as "bass boost".)

PZM MICROPHONE:
Pressure Zone Microphone.

Q-FACTOR:
1. A measurement of the width or sharpness of an equalizer filter. The "Q" value will increase as the slope of the response curve increases. 2. "Q" is also used to represent the width of a speaker's dispersion. A "Q" value of 1 would apply to a truly omnidirectional speaker. As the directionality increases, the "Q" number increases.

RADIO FEED:
A signal from a remote location that is sent to a radio station. This feed may be routed over a telephone line or a microwave system.

RADIO FREQUENCY INTERFERENCE (RFI):
Any electrical signal capable of being propagated into and interfering with the proper operation of electrical or electronic equipment.

RADIO MICROPHONE: See WIRELESS DEVICES.

REAL TIME ANALYZER (RTA):
A piece of test equipment that measures and displays simultaneously the amplitude of various frequencies. It is often used in conjunction with Pink Noise for "tuning" a sound system to the acoustical characteristics of the room.

REFERENCE LEVEL:
Any predetermined signal level, such as 0 dBm or +4dBm, to which other levels are compared. Very often the reference level is labeled as zero dB and other levels are then compared to it as either plus or minus a certain number of dB.

RESONANCE:
The state at which an object's natural vibrating frequency coincides with the frequency of the driving force of that system. A building's resonant frequency is often a feedback prone point for the sound system.

REVERBERATION:
1. The sound that continues in a room after the original sound stops. Sometimes reverberation is added to a sound electronically to enhance the original sound. 2. A series of echoes which arrive so close together in time that the ear cannot separate them. (See Also RT-60).

RF:
An abbreviation for Radio Frequency.

RIAA:
An abbreviation for Recording Industry Association of America, an organization whose recommended equalization characteristics for sound recording and reproduction have been accepted universally.

RIBBON MICROPHONE:
A microphone with a transducer consisting of a metallic ribbon suspended between the poles of a magnet. A ribbon mike is sometimes referred to as a "velocity microphone".

RINGING (Sound System):
A frequency that lingers in the room longer than all others after the original sound stops. Often a result of room resonance, it can be a potential sound system feedback frequency.

RMS:
An abbreviation for Root-Mean-Square. A power measurement which provides an indication of an amplifier's continuous power output capabilities at a specified distortion level, bandwidth, and impedance load.

RTA: See REAL TIME ANALYZER

ROLL-OFF:
A gradual decreasing of signal level as frequency increases (for high frequency roll-off) or as frequency decreases (for low frequency roll-off). Roll-off is usually indicated in dB per octave.

RT-60 (Reverberation Time):
The time required for the sound to drop 60 dB in level after the source of the sound has been stopped. This is an acoustical measurement that describes the "liveness" or "deadness" of a room's acoustics.

RUMBLE FILTER:
A circuit often used in stereo preamplifiers to reduce the low frequency rumble generated from a turntable's mechanical vibration which is picked up by the phone cartridge and tone arm.

SATURATION:
The state where a magnetic tape can no longer accommodate a higher signal level. Adding signal at a level higher than the saturation point will result in distortion.

SCOPE: See Oscilloscope

SECONDARY WINDINGS:
The output side of a transformer.

SENSITIVITY:
1. (Microphone Sensitivity) The response of a microphone to sound pressure. Sensitivity is most often defined as the output voltage of a mike in dB, referenced to 1 milliwatt (mW) at a SPL of 10 dynes/cm squared for a specific frequency. 2. (Speaker Sensitivity) The response of a speaker to an amplifier's output power. A speaker's sensitivity is generally defined as the SPL generated when one watt of power is applied to the speaker and when the SPL measurement is made at a four foot or one meter distance from the speaker.

SEPARATION:
In multitrack recording, the degree of acoustic isolation between adjacent tracks.

SERVO:

An abbreviation for Servomotor, which is an electronic regulator whose speed or position is determined by a correction voltage.

SHELVING FILTER:
An equalization (tone control) filter often found on a mixer or equalizer to cut or boost all frequencies either above or below a given point to a predetermined level in dB. On some shelving filters the beginning point can be moved up or down.

SHIELD:
A metallic covering placed around a cable or electronic circuit to decrease the effects of unwanted signals that could enter the system especially from RFI.

SHOCK MOUNT:
A device that reduces the transfer of mechanical vibration to the microphone diaphragm.

SIBILANCE:
A hissing sound produced when a person uses "S" or "Z". Excessive sibilance can sometimes be reduced acoustically by talking across the mike instead of straight into it or electronically through the use of equalization or a "de-esser".

SIGNAL-TO-NOISE RATIO (S/N):
Expressed in dB, S/N is the proportion of desired signal to the random noise which is within the total signal.

SLAVE:
A machine that is controlled by another device. Often this is referring to a tape or cassette duplicator expander which allows additional copies to be made during the duplicating process.

SLEEPER:
A hidden, on-stage monitor. (Also see MONITOR.)

SMPTE:
An acronym for Society of Motion Picture and Television Engineers which has established standards used in the film and video industry such as SMPTE time code.

SOUND LEVEL METER:
A device that measures SPL (Sound Pressure Level). All frequencies are averaged together rather than shown as individual frequency bands as with a Real Time Analyzer.

SOUND-ON-SOUND:
A recording machine feature or a recording technique where one signal is recorded adjacent to or in combination with another which has been previously recorded.

SOUND PRESSURE LEVEL (SPL):
Sound, through vibration, causes variation in atmospheric pressure. When these variations reach our ears, we interpret them as sound. SPL is the acoustic volume level of the sound and is often measured and given in dB-SPL. Zero dB-SPL is the faintest sound the human ear can detect.

SOUND REINFORCEMENT SYSTEM:
A combination of audio components which amplify and/or direct the natural sound to aid the listener's hearing. A sound reinforcement system should amplify the natural sound without adding any coloration to the original sound.

SPEAKER:
A device that changes electrical energy into the acoustical energy of sound. (Also see TRANSDUCER.)

SPECTRUM ANALYZER:
A device designed to display the frequency distribution and relative level of the frequencies contained in a signal. (Also see REAL TIME ANALYZER.)

SPL: See SOUND PRESSURE LEVEL.

SPLITTER TRANSFORMER:
A specialized transformer to provide multiple outputs from one input while maintaining a proper impedance load match to all connected components. (Also see TRANSFORMERS.)

STANDING WAVES:
A phenomenon of resonance caused by the geometry and materials that are inherent to a given acoustic environment. In any enclosed area having parallel and sound-reflective surfaces, specific wavelengths of sustained sound will cancel or reinforce themselves and, therefore, alter their levels relative to the other frequencies present. The reinforced wavelengths are standing waves. Cancellation effects of standing waves will create "dead" spots or areas of soft volume. Likewise, areas containing in-phase standing waves will experience louder volumes.

SUPERCARDIOID:
A variation on a cardioid microphone pattern with two lobes, front and rear, where the rear lobe is much smaller than the front lobe. A short shotgun microphone has a supercardioid pick up pattern.

T-PAD:
A circuit designed to reduce the voltage level in an unbalanced line.

TALKBACK:
A one-way communication system usually used by technical people to talk to performers or a director to communicate with his technical and production staff.

TDS:
An abbreviation for Time Delay Spectrometry. A new technique of acoustic measurement.

TEF:
An abbreviation for Time-Energy-Frequency. This measurement allows the examination of sound from its component parts of time, energy, and frequency.

THRESHOLD:
The user-adjustable level at which an electronic device such as a limiter begins to act on the signal.

THUMP:
A low-frequency transient quite often caused by turning a system on or off. Such a jolt can be harmful to the loudspeakers.

THIELE-SMALL:
A set of mathematical parameters devised by A.N. Thiele which allowed a speaker designer to predict or tailor a speaker enclosure's performance to a specific application.

TIMBRE:
The characteristic quality of a sound, independent of pitch or loudness which allows us to recognize one instrument from another even though both are playing the same note.

TIME-align:
A circuit design, developed by E.M. Long, which allows the sound coming from two different speakers to leave their transducers at exactly the same point in time.

TONE CONTROLS:
Circuits that vary the amplitude of bass and treble frequencies. Their primary use is to alter the tonal balance in pre-recorded material or to enhance a live performer's sound. Tone controls are also somewhat effective in controlling feedback.

TONE GENERATOR:
A device that produces a signal which can be fed into a circuit for testing purposes.

TRANSDUCER:
A device that converts energy from one form to another. Common transducers are: 1) a microphone, which changes acoustical energy to electrical energy and 2) a speaker which changes electrical energy to acoustical energy.

TRANSIENT:
A very sharp, or abrupt, momentary increase in signal level.

TRANSIENT INTERMODULATION DISTORTION (TID):
Distortion that occurs when the amplifier is not able to reproduce the transient signals.

TRANSFORMER:
A device comprised of at least two coils of wire wrapped in relation to a central core. Voltage is applied to the input of the first coil (primary winding), converted to magnetic energy and then transferred through the core to the second coil (secondary winding) where it is converted back to a voltage. Depending on the number of windings in each coil, a transformer will step up (increase) or step down (decrease) the voltage. Transformers can be placed "in-line" between components for such purposes as isolation, line balancing, impedance matching, RF protection, or additional circuit connections. (Also see LINE MATCHING TRANSFORMER, PRIMARY WINDING, SECONDARY WINDING, SPLITTER TRANSFORMER.)

TRICKLE CHARGE:
A low rate of charge that, when connected to the proper batteries, maintains their charge.

TWEETER:

A high frequency driver, usually or frequencies above 3,000 Hertz.

UHF:
An abbreviation for Ultra High Frequency. Channels 14 through 83 on a television set are in the UHF frequency band.

UNBALANCED LINE:
A microphone cable or patch cord consisting of one conductor plus a shield. This can be two or more conductors plus shield if all conductors have exactly the same signal, if one conductor is connected to the shield, or if the conductors have unequal voltage between them with respect to ground.

UNIDIRECTIONAL:
A pickup pattern of a microphone that is most sensitive in one direction. (Also see CARDIOID.)

UNITY GAIN:
A condition of a circuit where the output level is the same as the input level.

UPSTAGE:
The performing area furthest from the audience or camera. Opposite of DOWNSTAGE.

VCA:
An abbreviation for Voltage Controlled Amplifier.

VCO:
An abbreviation for Voltage Controlled Oscillator.

VELOCITY MICROPHONE: See RIBBON MICROPHONE.

VHF:
An abbreviation for Very High Frequency. Channels 2 through 13 on a television set are in this frequency broadcast band.

VOICE OVER:
The spoken words added to pre-recorded material. (Also see LIP SYNC, OVERDUB.)

VOLTAGE:
The electrical pressure of the current in a circuit.

VTR:
An abbreviation for Video Tape Recorder. A device which records sound and pictures on the magnetic tape.

VU:
An abbreviation for Volume Units. Used to indicate audio levels.

WATT:
The unit of electrical power required to do the work at a rate of one joule per second. One watt is dissipated when a current of one amp flows through a resistance of one ohm. The relationship can be expressed as P(watts) = I(amps) x E(volts).

WHITE NOISE:
A random noise whose power unit per frequency is consistent for each frequency throughout a specific range.

WINDSCREEN:
A shield to protect the microphone from air movement. Wind causes extremely low frequency sound in the microphone which, when amplified, can cause clipping in the amplifier and extreme excursion of the speaker cone.

WIRELESS DEVICES:
Units that can transmit signals through the air on radio frequencies instead of through connecting wires. Wireless microphones and wireless intercoms are good examples.

WOOFER:
The low frequency speaker in a loudspeaker system.

WOW:
Distortion caused by relatively slow variation of speed of a tape machine or turntable.

ZENITH:
The perpendicular angle between the tape head and the recording deck.

ZERO LEVEL:
A standard reference level equal to a voltage of 0.775V RMS across a 600 ohm load. Also sometimes used as a point of reference. (Also see REFERENCE LEVEL.)

Updated Oct 2005