



SOUND LEVEL METER

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Analog-Display Sound-Level Meter

By Radio Shack Cat. # 33-2050

Controls & Operation

Controls

RANGE Selector - The RANGE selector lets you select one of seven sound level ranges, each spanning 16 dB. The RANGE numbers refer to the center points of the seven ranges. The needle indicator shows the actual sound level as a displacement from the center point. For example, if RANGE is set to 80 and the meter scale reads -3, the actual sound level is 77 dB (80 - 3). If the meter scale reads 0 (same as the value where RANGE is set), the actual sound level is 80 dB (80 + 0).

OUTPUT Jack - The phono-type OUTPUT jack lets you connect the meter to recording or other measurement equipment. For example, you might use an audio patch cord to connect the meter to the AUX or high-level input of a recorder. Note: The meter response will not be flat, due to the A- and C- weighting networks. Set RANGE so the maximum needle deflection is never greater than +4, to prevent the built-in amplifier from clipping. Use A-weighting for voice recordings, or C-weighting for full-range musical material. The OUTPUT jack can also be connected to high-impedance headphones, or an oscilloscope, a frequency analyzer, or other test equipment.

RESPONSE Selector - The RESPONSE selector has two settings: FAST and SLOW. In the FAST position, the meter reacts quickly to changes in the sound level, showing you the peak sound levels present in the environment. In the SLOW position, the meter is damped and indicates an average-value sound level. The effect of brief sound peaks is minimized in the SLOW position.

WEIGHTING Selector - Set WEIGHTING to weight the sound measurement for a particular frequency range. When set to A, the meter primarily measures frequencies in the 500-10,000 Hz range, which is the area of greatest sensitivity to the human ear. When set to C, the meter measures uniformly over the frequency range from 32-10,000 Hz, giving an indication of the overall sound level.

MICROPHONE - The meter's built-in microphone works best when you point it directly at a sound source. **TRIPOD ADAPTER** - You can mount the meter on a camera tripod (standard 1/4 - 20 thread) to eliminate hand noise and minimize the effects of sound reflected from your body. This makes it easy to use the meter with auxiliary recording or test equipment.

CAL (CALIBRATION) - Your meter has been accurately calibrated and normally will not require further adjustment. If adjustment is necessary, take the sound meter to an audio professional who can calibrate the meter by connecting special equipment, such as a sound generator, to the CAL jack.

Operation

IMPORTANT: Do not hold the meter directly between you and the sound source, as this might produce an error of several decibels in the frequency range above 100 Hz. Position the meter so an imaginary line between you and the meter is perpendicular to a line between the meter and the sound source. Handle the meter carefully. The microphone and meter movement are fragile and might be damaged if the instrument is dropped. Do not operate the meter at a range setting that causes "pegging" of the needle. This could damage the movement. Follow these steps to select the desired response, weighting, and range. 1. Set RESPONSE to FAST if the sound source you want to measure consists of short bursts or if you want to measure only peak values. Or, set RESPONSE to SLOW if you want to measure average sound levels. 2. Set WEIGHTING to A if you want to measure noise level or C if you want to measure sound levels of musical material. 3. Set RANGE to the highest setting (120 dB) then adjust it downward until there is significant deflection of the needle. For the greatest accuracy, always use the lower of any two possible settings. For example, if RANGE is set to 80 dB and the meter reads around -5, reset RANGE to 70 dB so the meter reads +3, for an actual sound level of 73 dB. **IMPORTANT:** For meaningful readings, any particular sound to be measured must be at least 10 dB louder than the background noise level. While taking measurements, minimize the effect of your body's presence. When the sound is coming mainly from one direction, the level reading might be significantly affected by reflections from your body. For the most accurate readings and the best polar response, point the meter's microphone toward the sound source when possible.

Checking Noise Levels Noise is inevitable in almost any environment. Depending on the level and duration, noise can be a minor irritant, a definite disturbance, or even a threat to your hearing. To use your meter to check noise levels, set

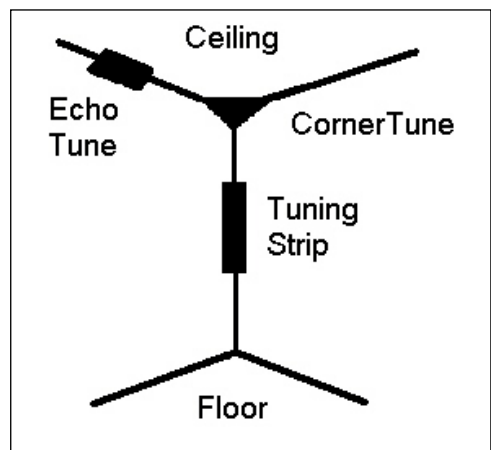
Operation (continue)

WEIGHTING to A and RESPONSE to SLOW. Take measurements at several points in the test area, with the meter positioned properly.

Checking Room Acoustics The size, shape, and furnishings of a room can have a tremendous effect on a home theater system's performance. A "hard" room with bare surfaces tends to exaggerate treble response, sometimes giving the music a strident quality. A "soft" room with curtains, overstuffed furniture, carpet, etc. might reduce high-frequency response. This may result in a dominant bass sound. Depending on the speaker placement, standing waves might also develop in the room, giving your system a "peaky," eccentric response. To determine a room's acoustics, analyze the room's acoustics with your meter and a **(optional)** suitable test recording. The test recording should produce pure tones, one at a time, at intervals spanning the audio spectrum. Make a graph or table showing the sound levels generated by the individual tones. This gives you a clear idea of the frequency response of your "total system" - home theater equipment and room included. To smooth out the response, acoustic treatment may be required. To approximate the ideal, "flat response", you could add a frequency equalizer to your home theater system. Properly equalized, your system can sound like one costing considerably more! Note: When checking the frequency response, if WEIGHTING is set to C, the meter's frequency response is flat from 32 to 10,000 Hz (+/- 3 dB). Above 10 kHz, the frequency response of the meter drops off rapidly. Be sure to consider this when you use a test recording that includes tones at the extreme high end of the audio spectrum.

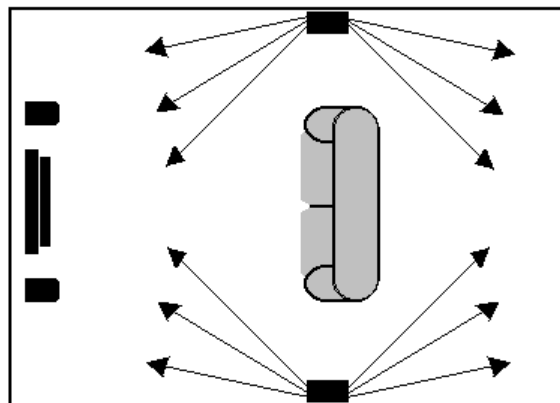
Helpful Room Tuning Ideas Can Be Demonstrated At Fred's Sound Of Music

Sound is vibration and in a room these vibrations will tend to gather against, and move along the large, uninterrupted flat surfaces such as the walls and ceilings. When these wall and ceiling surfaces meet at the corners and seams of the room, acoustic pressure builds. The most important of these "pressure zones" are the upper corners of the room, where three of these flat surfaces will build pressure, which is then reflected back into the room with a horn-loading effect.



Usage of acoustic treatments can be demonstrated in our sound rooms. And at the same time we can help you with your own room at home so you can achieve the best sound possible from your stereo or home theater system.

Home Theater systems' sound performance is not just placing the speakers at the proper position and angle. Reducing or eliminating reflective sounds in the room for pin-point sound accuracy is most critical for the **"Best Theater Performance"**



More information about Room Tuning and Speaker Surrounds for Home Theater, Go To Our On-Line Newsletter

www.fredsoundofmusic.com

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