



Transmitter Audio Gain vs Signal to Noise Ratio

The transmitter input gain is the single most important adjustment on any wireless mic system to insure an optimum signal to noise ratio. (We can't stress this enough!)

The audio signal to noise ratio will never be any better than it is at the transmitter input. If the input signal is noisy at the transmitter, there is nothing else that can be done later to restore it to its original quality. The audio level is adjusted with the gain control on the transmitter, with some sort of level metering on either the transmitter or receiver.

The most difficult problem with properly adjusting the transmitter input gain involves duplicating the user's voice level in advance of the actual performance or use. Obviously, you need some sort of metering in order to correctly set the transmitter input gain. The metering must indicate the modulation level of the radio signal and also limiting in the transmitter. Pro Series Lectrosonics transmitters provide LED level metering for this purpose. Metering is also provided on the receivers, but often times the transmitter metering is easier to use, since the receiver may not be accessible or visible from the transmitter location during setup.

The following is an excerpt from the Lectrosonics UM195 Transmitter manual. Although the details may differ depending on what transmitter is being used, the general procedure is valid for most transmitters.

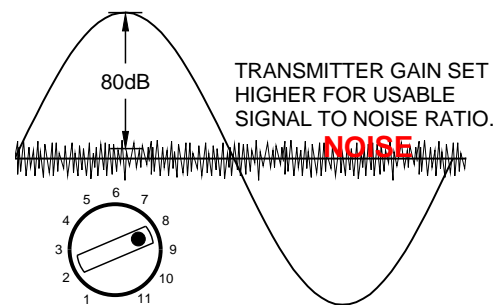
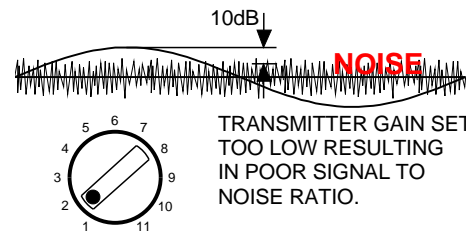
1. Position the microphone in the location you will use in actual operation.
2. While speaking or singing at the same voice level that will actually be used, observe the MOD LEVEL LEDs. Adjust the MIC LEVEL control knob until the LEDs begin to light. Start at a low setting where neither LED lights as you speak. Gradually, turn the gain up until one LED lights, then the other.

The LEVEL (or -20) LED lights when the audio level is about 12dB below full modulation. The LIMIT (or 0dB) LED lights when the limiter begins to operate. There is over 40dB of limiting range without overload above the LIMIT LED, so it is normal that the LIMIT LED light up 5% to 10% of the time during use.

3. Once the gain has been adjusted, the transmitter audio can be turned on to make sound system level adjustments. Set the power switch to the ON position and adjust the receiver and/or sound system level as required. Please note, there will be a delay between the moment the switch is thrown and the time when audio will actually pass through to the amplifier. This intentional delay eliminates turn on thumps, and is controlled by the pilot tone squelch control.

OPERATING NOTES

The MIC LEVEL control knob should not be used to control the volume of your sound system or recorder levels. This gain adjustment matches the transmitter gain with the user's voice



level and microphone positioning. If the mic level is too high -- both LEDs will light frequently or stay lit. This condition may reduce the dynamic range of the audio signal.

If the mic level is too low -- neither LED will light, or the LEVEL LED will light dimly. This condition may cause hiss and noise in the audio.

The first LED turns on 12dB below full deviation. The limiting LED turns on at full deviation and indicates that the input shunt compressor is operating. The input limiter will handle peaks over 40dB above full modulation, regardless of the gain control setting. The limiter uses a true absolute value circuit to detect both positive and negative peaks. The attack time is 5 milliseconds and the release time is 200 milliseconds. Occasional limiting is desirable, indicating that the gain is correctly set and the transmitter is fully modulated for optimum signal to noise ratio.

Different voices will usually require different settings of the MIC LEVEL control, so check this adjustment as each new person uses the system. If several different people will be using the transmitter and there is not time to make the adjustment for each individual, adjust it for the loudest voice.