# Antenna Noise Gain Additional Comments

This is an easy way to tell whether you need to enable the preamp, or even enable the attenuator on the low HF bands.

If you have an **analog** voltmeter with a dB scale you can make this measurement. It could be a Triplett 630 or a Simpson 260 or any kind of meter with a dB scale. "By the book" it should be a True RMS responding meter, but for this antenna noise gain test it isn't necessary. Any meter will be acceptable.

Hook your meter up to an external speaker or the in parallel with your headphones. You want to be able to hear what the meter is reading. First attach a 50 ohm termination (dummy load) at the antenna jack. If you don't have a 50 ohm load then just leave the antenna jack open circuit. We are not trying to be a metrology lab at this point. A small measurement error is acceptable.

Adjust the volume control so the noise coming out of the radio reads -10 dB on the voltmeter scale. Pick a scale on the meter so the level out the speaker or headphones is a comfortable level. This becomes your receiver noise reference. Now connect your antenna and tune to a dead spot on the band. Measure how much the band noise went up from the -10 dB reference level. If it went up only 3 dB the receiver is contributing half the noise. If it went up 10 dB the receiver is contributing almost no noise. In this case Band Noise is dominates and your receiver sensitivity is a non-issue. I suggest making the measurement with an SSB bandwidth of 2.4 kHz, but the bandwidth doesn't matter. You would get the same answer with a 500-Hz CW bandwidth for example. Since this is a relative measurement any bandwidth is fine. If the increased reading with the antenna connected is less than 6 dB you need a preamp on that band.

It would be very unusual to need a preamp below 10 MHz. During the 2023 ARRL DX SSB 48 hour contest I only used a preamp on an IC-7610 for 30 minutes while I was running (working) stations in Japan. The band was in such good a shape that signals were quite strong, and band noise was also louder than is typical. (The antenna was a 5-element mono-band Yagi at 65 feet.)

Once you get familiar with making an "antenna noise gain" measurement you can do a quick check by ear. If you don't need a preamp, leave it OFF. If the antenna noise gain is marginal, then turn ON the preamp.

By the way, I often use an Icom R8600 receiver tuned to WSJT X digital signals and use them as a beacon to see if the band is open. In one case FT8 signals were quite strong up to 15 meters but virtually dead on 12 meters. I have also decoded FST4 signals on 630 meters (475 kHz) on the east to west coasts using the R8600 in SSB mode. In general a radio will rarely be the limit so focus on better antennas.

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