Technical Note

Measuring ultrasound with the Nor145 and Nor150

There is increasing awareness of the effects of ultrasound on humans, as well as growing demand for measurements in the ultrasonic frequency range across various applications.

The Nor145 and Nor150 are well suited for ultrasound measurements when equipped with Option 14 – Ultrasound, which extends the 1/3-octave filter range up to 40 kHz. However, the standard microphones and preamplifiers supplied with these instruments are optimized to meet the requirements of IEC 61672 and equivalent standards.

The Nor145 is normally supplied with either a Nor1227 or Nor1239 free-field microphone, while the Nor150 is supplied with a Nor1225 microphone. All are ½" – 50mV/Pa free field microphones complying with the requirements for a Class 1 sound level meter according to IEC 61672 and equivalent standards. However, the high-frequency response and physical dimensions of these microphones make them unsuitable for ultrasound measurements.

Microphone and Preamplifier Considerations

The high-frequency response limitations and physical size of ½-inch microphone capsules make them unsuitable for ultrasound measurements. For such applications, ¼-inch or 1/8-inch capsules are recommended. Additional precautions should also be taken to minimize acoustic reflections from the operator and the instrument housing.

The frequency response of the preamplifier itself is generally not a limiting factor (see figure below). However, the physical size of the standard ½-inch preamplifier must also be considered. It is therefore recommended to use either a ¼-inch preamplifier or a ½-inch-to-¼-inch adapter, such as the RION UA-12 or the GRAS RA0019.

Please note that ¼-inch or 1/8" microphones are generally less sensitive and thus have a higher self-noise limiting the ability to measure low noise applications.

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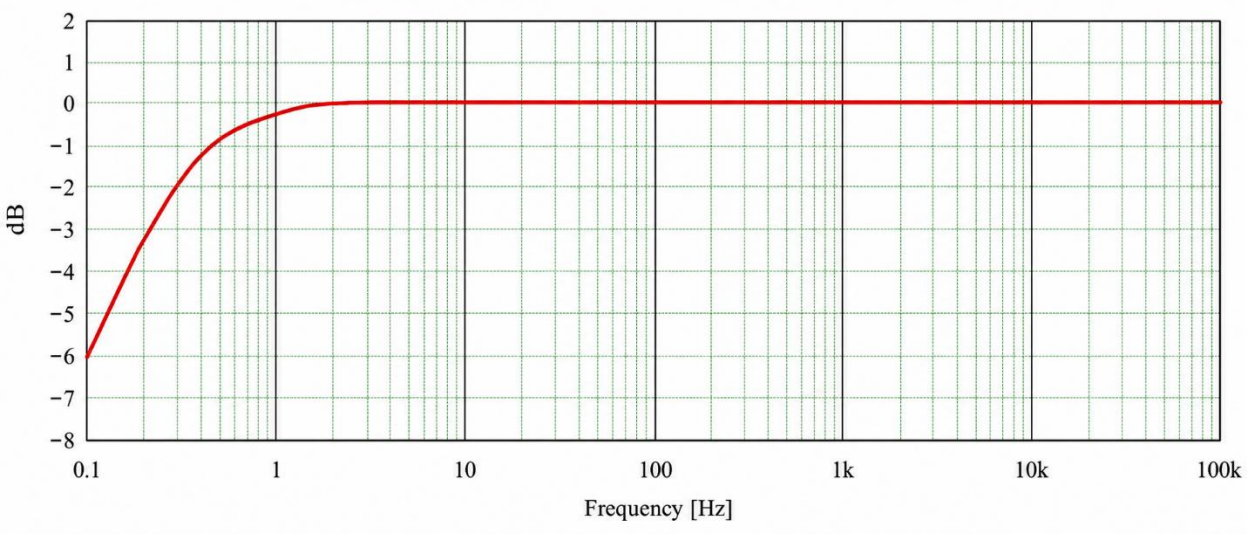

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