

Can I configure KEMAR for measurements of active-noise-cancellation (ANC) and Bluetooth headphones/headsets electrical circuit hiss noise?

Yes, it is possible. Active Noise Cancellation and Bluetooth headphones/headsets tend to have a “hiss” noise in quiet surroundings. This “hiss” can be detected via subjective testing, but when it comes to objective measurements, this phenomenon cannot be measured with traditional ear simulators, like the 60318-4 Ear Simulator (aka 711 coupler) or standard measurement microphones. This is because standard ear simulators and microphones have a noise floor around 20 dBA, which is usually higher than the hiss noise produced by the ANC or bluetooth circuitry. This is why, even though the human ear can hear this noise, regular measurement microphones and ear simulators can't measure the signals.

GRAS offers a special type of 711 style ear simulator with Low-noise specifications, the GRAS 43BB-1 Low-noise ear simulator. This ear simulator can be mounted on a KEMAR head and torso simulator (HATS) to perform measurements down to 10.5 dBA.

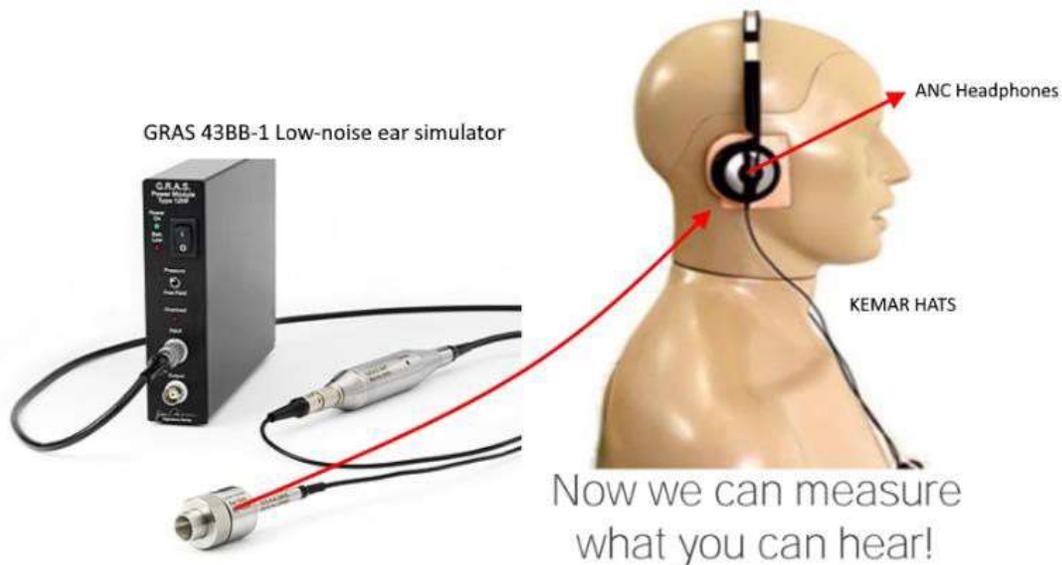


Figure 1. GRAS 43BB-1 Low-noise ear simulator can be mounted inside a KEMAR HATS for low-noise measurements down to 10.5 dBA.

Below there is a chart showing an ANC test performed with ANC Headphones using a GRAS KEMAR head and torso simulator (HATS):

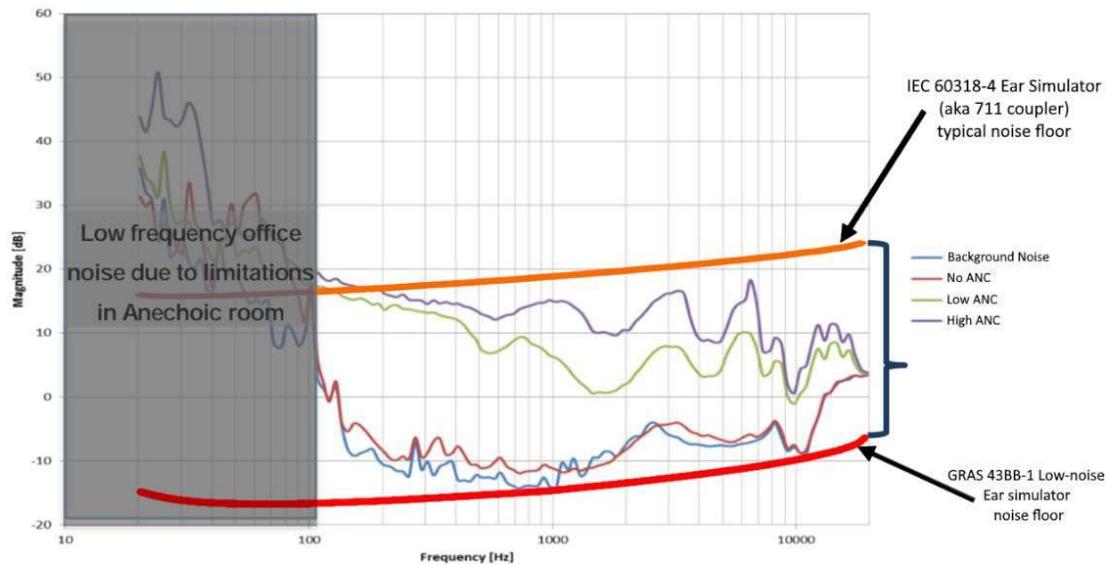


Figure 2. ANC Test performed with ANC supra-aural headphones on KEMAR HATS with low-noise ear simulators.

The orange curve on the top shows the typical noise floor curve of a IEC 60318-4 ear simulator (aka 711 coupler). Dark red and blue curves show the background noise measured inside the anechoic chamber using the KEMAR HATS with and without the headphones, respectively. When the ANC headphones are turned on, the hiss noise can be heard. This noise is noise generated by the internal circuitry itself when the ANC is turned on (no reference signals or music is being played through the headphones). The violet and green curves show the hiss noise profiles when using the Low and High ANC circuits available in these headphones.

All the measured curves in the chart above, are below the noise floor of a typical IEC 60318-4 ear simulator. This means that a standard ear simulator with regular measurement microphones will not be sufficient to measure any of the signals measured above. On the other hand, the bright red curve is showing the noise floor of a 43BB-1 low-noise ear simulator. With a system like this mounted in a KEMAR HATS, it is possible to measure ANC and Bluetooth circuits hiss noise.

43BB-1 Low-noise ear simulator can be used mounted in a KEMAR, but also inside a [GRAS 45CA Test Fixture](#) (ask Global Support for more information about this option) or standalone.