

CASE STUDY

Objective Analysis Supports Audiophile's Perception

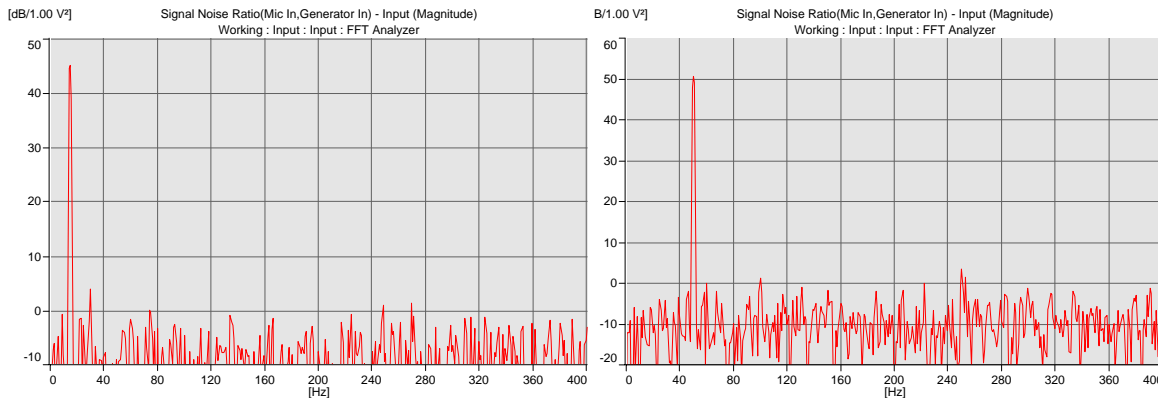
As with true enthusiasts in any area of interest, audiophiles are generally willing to pay premium prices for high-quality products. Occasionally, however, listeners can be pleasantly surprised by equipment offering superior performance at reasonable prices.

A private home-theater enthusiast was in the market for a new powered subwoofer for a media room. As is the case with most audiophiles, the individual read reviews, studied data sheets and arranged (through the good will of his dealer) to demo a variety of equipment in his own media room setting. During the course of these demos, he was pleasantly surprised with one particular model (a Definitive Technology SuperCube II), which happened to be the smallest and least expensive of the collection.

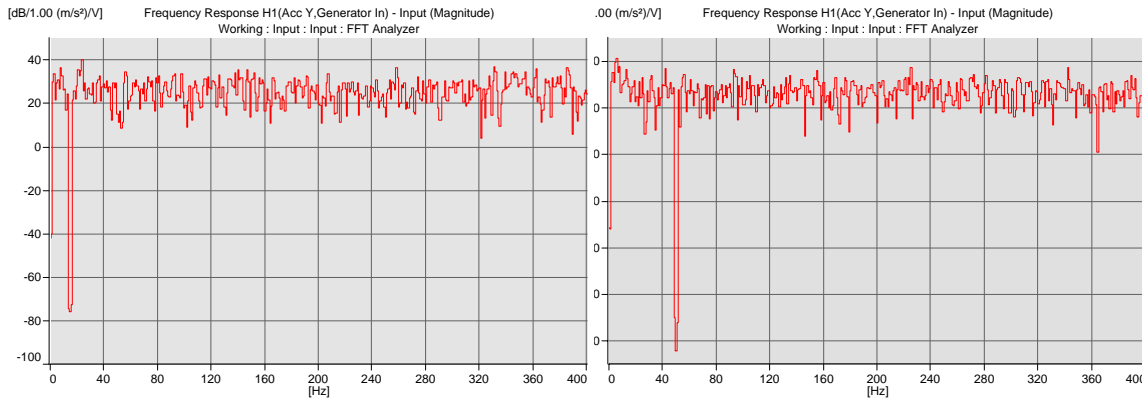
Opus Technologies was contacted and asked if it were possible to quantify the differences between the various models, and confirm what the listener suspected regarding the superior performance of a relatively small and reasonably priced model.

Due to the very nature of low frequency sound and vibrations, it was decided that the testing should be performed using accelerometers as well as the standard measurement microphones. Three accelerometers were mounted tri-axially on one of the top corners of each unit, and the measurement microphones were positioned in accordance with AES standards. A sine wave generator was used to supply steady-state signals directly to the built-in amplifier on each unit. Tests of each subwoofer were made at frequencies of 5, 10, 15, 20, 50 and 100 Hertz.

Two examples of the data collected on the SuperCube II model using the microphone signal are shown below. These depict the S/N ratios at 15 and 50 Hz respectively.



The following charts represent frequency response data collected using the “Y-axis” accelerometer (aligned axially with the primary active driver). Again, these data are from the SuperCube II model at 15 and 50 Hz.



Although not illustrated in this case study review, all other models were also tested as described above. In addition to the signal-noise ratio and frequency response analyses, the following were studied for each unit:

- Various spectra
- Coherence
- Coherent Power

Analytical comparisons between the different models were completed, and by and large confirmed the listener's original observations. Based on this information, the client was very confident in purchasing what may have otherwise been overlooked as an undersized subwoofer for his particular application.

In conclusion, although an audiophile's ear may be his or her most valuable tool, data-driven analytical confirmation of perceived performance can prove to be very useful.

Only a fraction of the data collected and analyzed during the duration of this project are provided in this case study, and are presented to give the reader a brief synopsis of the project's objectives, results and conclusions. Additional information will be supplied upon request, provided doing so does not violate existing non-disclosure agreements or result in a conflict of interest situation.