Sound innovations:
The manufacturer‘s view

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Pushing the Limits
ADAM Audio SX-Series

by Robert Caputo

Introduced at AES in New York in 2009, but already used in leading recording and broadcast facilities around the world, the SX Series from ADAM Audio grew out of a desire by company founder Klaus Heinz and his engineering team at ADAM Audio to maximize the efficiency of the company‘s already well-accepted SA Series studio monitor systems.

Founded on the mission of achieving absolute transparency with the emphasis on hearing the music not the speakers, the company was now challenged to push the limits of the high-frequency, midrange and low-frequency performance of its monitors.

Heinz and engineer Roland Stenz originally founded ADAM Audio in 1999 with its proprietary Accelerating Ribbon Technology (ART), a new approach to Dr. Oskar Heil‘s Air Motion Transformer concept that overcame the piston-like motion of a traditional driver to improve air loading by a factor of 4 over conventional transducers.

The ART membrane consists of a pleated diaphragm in which the folds compress or expand cording to the audio signal applied to them. The result is that air is drawn in and squeezed out, like the bellows of an accordion.

To illustrate the basic principle with a simple analogy: When you breathe, your thorax is moving slowly, whereas the air is moving comparably fast. Similarly, the ART diaphragm presses the air faster in or out of its folds than they themselves are moving. This markedly superior „motor“ is responsible for the clarity and transient reproduction in the ART drive units.

Additionally, the ART tweeter‘s pleated membrane avoids the typical breakup/distortion and subsequent dynamic limiting at higher frequencies of stiffer voice coil designs found in dome and cone tweeters. In the ART design, the driving „stripes“ are in direct contact with the outer air and are cooled immediately. Thermal power handling of the units is increased, surpassing that of 1-inch domes by a factor of more than 2:1.

Diaphragm area is another important factor in determining the dynamic range of a transducer. Basically, what you see is what you get. The visible cone area of dome tweeter is the acoustically active area of the loudspeaker, which is true for practically all other drive units. By folding the ART diaphragm into the third dimension (as seen from the listening position), a larger foil can be used, thus increasing the acoustically effective area of the diaphragm by a factor of more than 2.5 times. This results in higher dynamic output with extremely wide dispersion.

For the SX Series, ADAM redesigned its new X-ART tweeter to operate with 4 dB higher efficiency and an increased maximum SPL of 3 dB with a frequency response expanded by up to 50 kHz (at -3 dB), compared to the SA Series.

After improving the most successful aspect of the SA Series, its high-frequency reproduction, ADAM engineers moved on to the critical midrange and low-end frequencies.

To maximize performance, they used Hexacone for the midrange drivers and woofers. The Hexacone core is a honeycomb Nomex structure, extremely light, stiff and rigid, coated with Kevlar for additional strength to resist elongation and other kinds of distortion.

The fact that HexaCone midrange drivers and woofers are more rigid than paper, polypropylene or aluminum devices of similar dimensions eliminates unwanted resonances in the diaphragm cone. The effective length and diameter of the voice coils in conjunction with the size of the magnets and the available cabinet volume are all precisely aligned for musically optimal, low-frequency reproduction. The X-ART midrange driver features 2 dB higher efficiency and 3 dB higher SPL than its SA Series predecessor.

To overcome another frequently observed problem in reference monitors, a disproportionately lower volume at the lower frequencies, ADAM designed the woofers to reproduce low frequencies with the highest level of authenticity, ensuring optimum translation to the widest range of systems and environments.

Powering was also a critical factor in the SX Series. Heinz designed a new A/B analog power amplifier, a departure from the D-Class amp in the SA Series, to ensure ultra low distortion and superior damping. An internal bandwidth of more than 1 MHz is externally limited so the unit delivers an ultra-wide response up to 300 kHz.

With six models in the series, much of the focus since its introduction has been on the „flagship“ S3X-H monitor system, currently being used in several Walters-Storyk-designed studios across the country.
The S3X-H uses a 4-inch HexaCone midrange driver for more detail and musical coherence in the midrange, along with two 7-inch Hexacone woofers to produce a deeper, tight bass within the same frequency and radiation pattern as the SA Series.

Combining these features and innovations into different sizes and price points as the S1X, S2X, S3X and S4X monitors, ADAM is pushing the standard for transparency in a monitor system to new levels.

Having established this benchmark with the SX Series, ADAM Audio is now moving to the new challenge of providing the same level of excellence at lower price points in the AX Series, to be introduced later this year.

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