

EARO

High Definition Audio

Our Technology

There is one singularly fundamental aspect of speakers, based on moving cones, that is widely known but seldom discussed, namely impedance mismatch. The moving cone is a non-ideal transducer of an electrical signal to the air. Due to the mismatch, energy is not efficiently put into the air. In conventional loudspeaker designs and in order to attain usable sound pressures, large power levels are required to move the cone a longer distance. This strategy results in loss of efficiency, increased distortion and most important of all, lack of transient (impulse) response. Each is a critical parameter for high fidelity in sound reproduction.

Our designs are based on principles of transforming the mechanical motion of a cone to a larger movement of air mass (volume per time-unit). This is carried out through a more optimized loading of the speaker driver cone movement to the air, resulting in a transformation of the smaller radiating area to a larger one. Whilst this significantly improves audio quality and efficiency, it also introduces physical and esthetical design complexities due to both size and geometry inside the cabinet.

Whilst the air inside a closed cabinet presents a non-linear resistance to the speaker cones motion, and thus introduces non-linear response (a.k.a distortion), our designs present a nearly pure linear load and is one of the reasons for the low distortion and high dynamic range.

Impedance mismatch also occurs outside of the speaker. As the pressure front expands as if it as a sphere from the driver and across the front, the baffle, it eventually meets the open space at the edges of the speaker cabinet. This abrupt change in radiation is a step-wise impedance shift and creates reflections. It is as if the edges of the cabinet are radiating sounds together with the drive units. The effect is called edge diffraction and it smears the point source and destroys imaging. Two ways to lessen these inevitable effects is to ensure the baffle is shaped correctly and the other is to employ as few drivers as possible.

Earo uses a single driver, albeit a very particular type, it does have to follow the laws of physics why the spherical wavefront also becomes more planar with rising frequency. This is a natural process and whilst it is commonly regarded as undesirable, hence the multitude of drivers on many other speaker designs, Earo accepts the natural narrowing of the spread as frequencies rises. The reward is immediately clear by producing a defined and phase accurate sound image.

This also assists in minimizing unwanted radiation into the room and its ever present influence on the listening perception.

All our designs are active speakers. This means they do not need an external power amplifier and need only be connected to a preamplifier. The signal processing, including the power amplifier, is matched to the speaker and becomes an integral part of the total solution. By this approach we ensure there is enough power available to respond to the full dynamic range at real life playing levels. The distortion levels are below limits of hearing and the integrated architecture ensures that the almost impossible task of designing passive crossover networks in conventional loudspeakers is

altogether avoided. Furthermore issues related to cabling and influence of unknown power amplifiers, are completely eliminated.

Earo is confident in the outstanding qualities of its products and believe that your ears can be trusted as the best instruments to assess performance, not specification sheets.

Use your ears and use Earo.

E A R O