

Exciters (Audio)

An audio exciter, also known as a tactile transducer or tactile speaker is a device that converts electrical signals into mechanical vibrations allowing surfaces to produce sound. Unlike traditional speakers that move air to produce sound, audio exciters vibrate objects to get sound waves. This technology has various applications and advantages, including improved distribution, energy efficiency, environmental protection and creative design possibilities.

Construction of an Audio Exciter:

- An audio exciter typically consists of the following components:
- Diaphragm: This is a thin, lightweight material that vibrates in response to electrical signals. It could be made of materials like paper, metal, or even advanced materials like piezoelectric ceramics.
- Voice Coil: A coil of wire attached to the diaphragm. When an electrical signal passes through the coil, it generates magnetic field that interacts with a magnet, causing the diaphragm to move.
- Magnet Assembly: A strong magnet, usually a neodymium magnet, is positioned close to the voice coil. The interaction between the magnetic field generated by the voice coil and the magnet causes the diaphragm to move back and forth rapidly creating vibrations.
- Frame and Suspension: The diaphragm is attached to a frame and a suspension system allows the diaphragm to move while maintaining position. This ensures the diaphragm returns to its resting position after each vibration.

Applications:

- Assistive Devices: Exciters can be utilized for sensory stimulation, therapeutic applications, or communication aids for Individuals with hearing impairment.
- Industrial and Automotive: Beyond entertainment, audio exciters can be used in industrial settings for vibration-based alert systems (like vibration alerts for blind spot monitoring)
- Flat Panel Speakers: Audio exciters can turn various surfaces into speakers, such as walls, ceilings, windows, and furniture. This is particularly useful for applications where traditional speakers would be impractical, aesthetically undesirable, or subject to harsh environments.
- Gaming and VR: When integrated into gaming chairs, headsets, and other accessories the immersive experience is enhanced by tactile feedback and sound effects.
- Architectural Integration: Creative interactive soundscapes can be incorporated and hidden in galleries, museums, and expositions.
- Retail and Advertising: Attention grabbing sound can emanate from various advertising surfaces.