

How Electrostatic Earspeaker Works

If we speak of a headphone, it usually means a dynamic one employing a dynamic transducer. In the dynamic transducer the driving force is applied only to the one part of the diaphragm which, therefore, must be stiff enough not to be deformed by air load. However, stiff materials considerably increase the diaphragm mass resulting in significant deterioration of transient response. In addition, the ununiform force applied over the diaphragm area leads to what is called "cone break-up". Hysteresis distortion caused through the magnet inevitable in the dynamic transducer cannot be ignored, either.

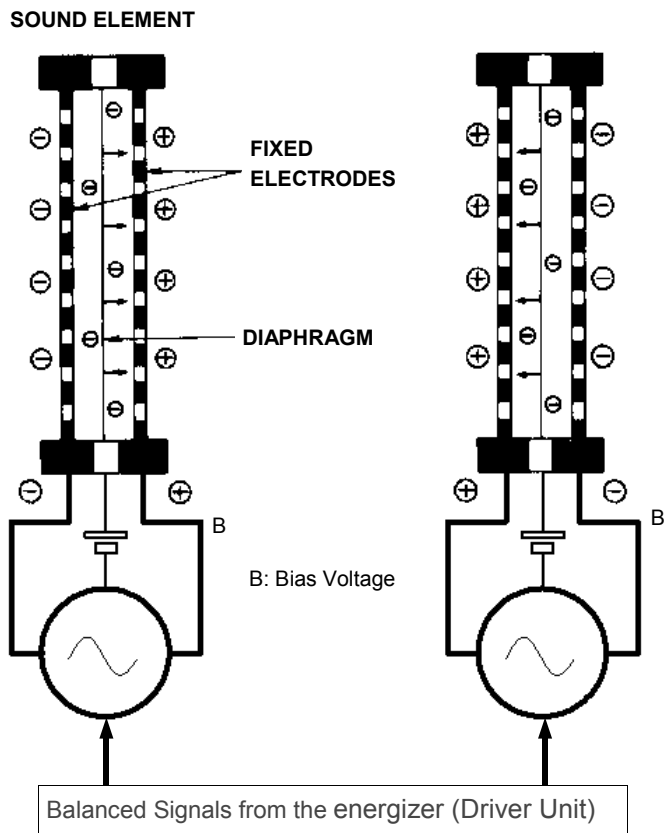
The electrostatic transducer adopted in the STAX earspeakers consists of two parallel-arranged fixed electrodes and several microns thick (less than 2 microns) high-polymer film diaphragm suspended in the middle of the electrodes. The low-mass film diaphragm is supplied with the biasing voltage from the energizer (Driver Unit).

When the fluctuating voltage of the audio signal is applied to the electrodes, the diaphragm is pulled by the electrode which has the opposite charge of the diaphragm's and simultaneously pushed by the other electrode which then has the like charge of the diaphragm's.

The continuous flow of alternating voltage in interpretation of audio signals causes the diaphragm to vibrate in faithful compliance with the amplifier output without time lag, assuring undistorted sound waves. This is why the STAX electrostatic earspeakers sound so good.

The figure on the right side shows the driving mechanism of the Stax earspeakers.

Principle Diagrams



Example of connection diagrams

