



UNIVERSITÀ
DEGLI STUDI DI TRIESTE



Headphones

A.Carini – Elettronica per l'audio e l'acustica

Headphones

- Varie tipologie:



Around-the-Ear
(Circumaural)



On-Ear
(Supra-Aural)



Earbud
(Intra-Concha)



Small On-Ear
(Supra-Concha)



In-Ear Monitor
(IEM, Insert)

Da <https://www.innerfidelity.com/content/physical-headphone-types-explained>

Electrodynamic Headphones

- Sono i più comuni



Da <https://www.innerfidelity.com/content/how-headphone-dynamic-drivers-work>

Electrodynamic Headphones



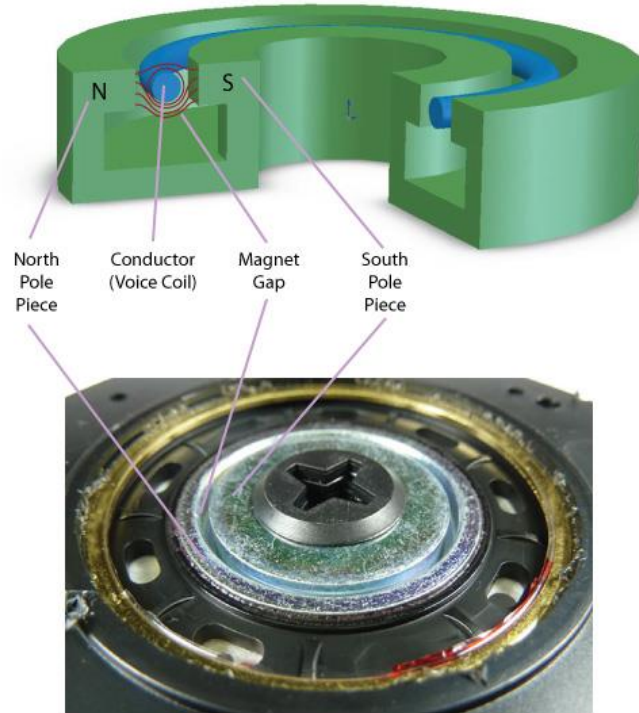
Da <https://www.innerfidelity.com/content/how-headphone-dynamic-drivers-work>

Electrodynamic Headphones



Da <https://www.innerfidelity.com/content/how-headphone-dynamic-drivers-work>

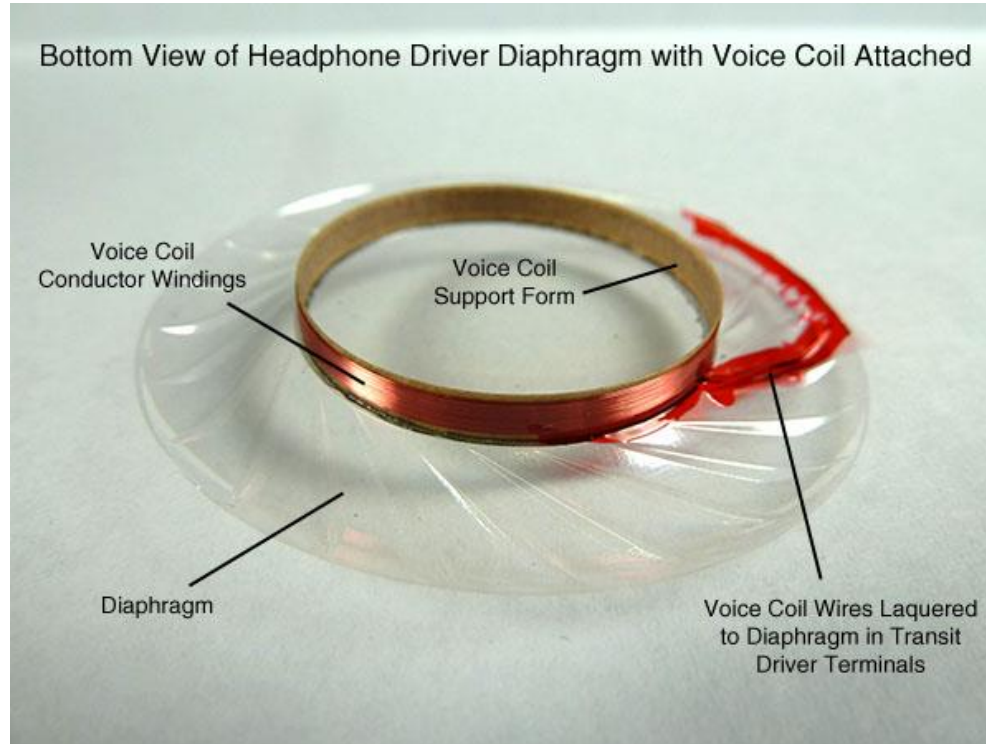
Electrodynamic Headphones



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Electrodynamic Headphones

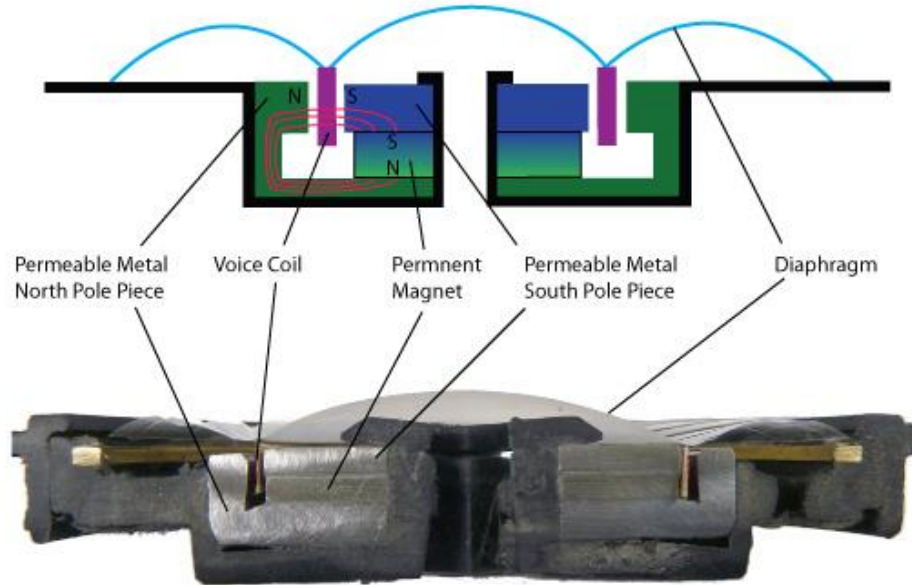
Bottom View of Headphone Driver Diaphragm with Voice Coil Attached



Da <https://www.innerfidelity.com/content/how-headphone-dynamic-drivers-work>

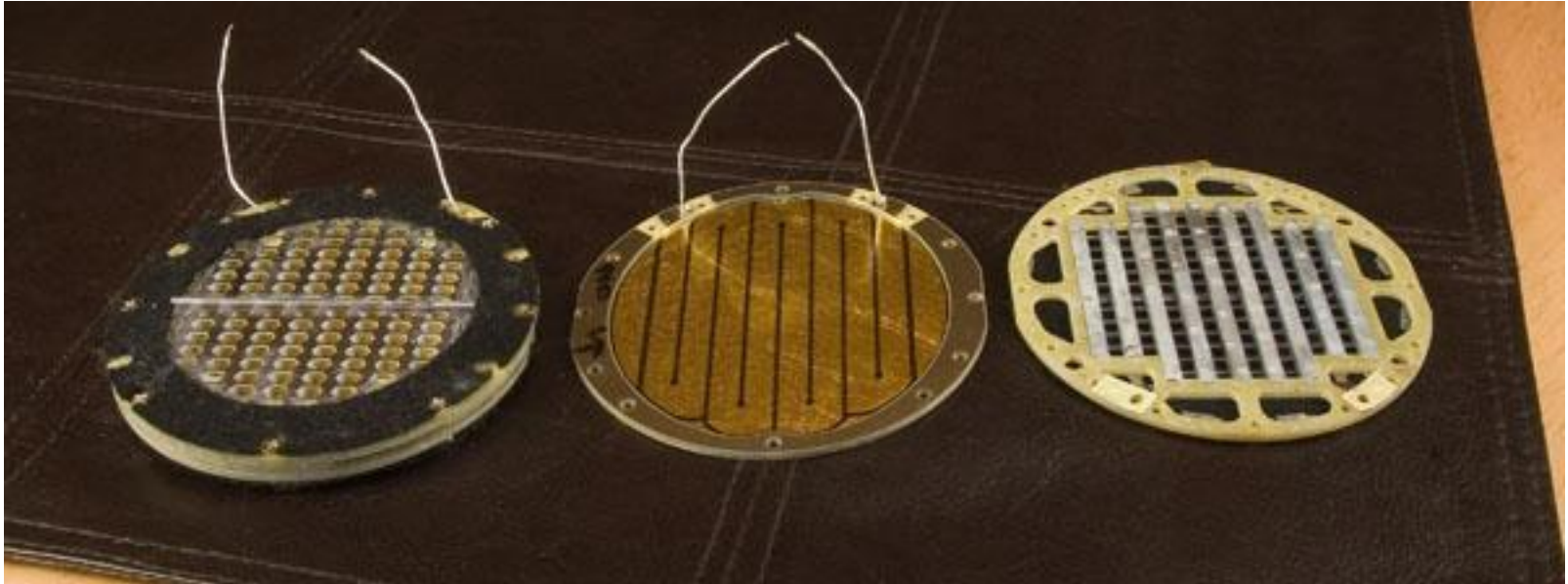
Electrodynamic Headphones

Dynamic Headphone Driver Magnetic Circuit



Da <https://www.innerfidelity.com/content/how-headphone-dynamic-drivers-work>

Planar Magnetic Headphone

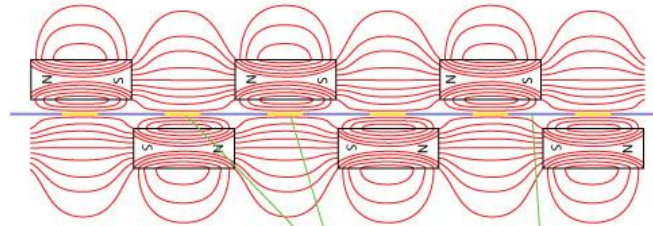


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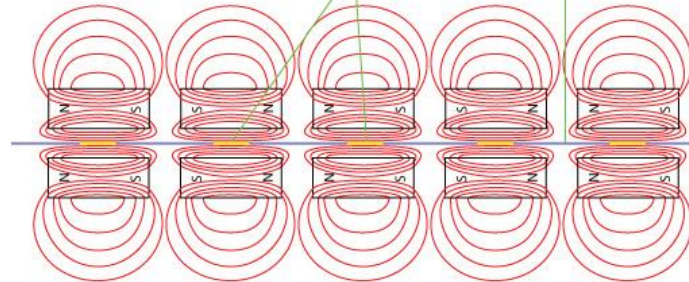
Planar Magnetic Headphone

Examples of Other Magnetic Circuits from Audeze Headphones

Audeze LCD-2 Magnetic Circuit

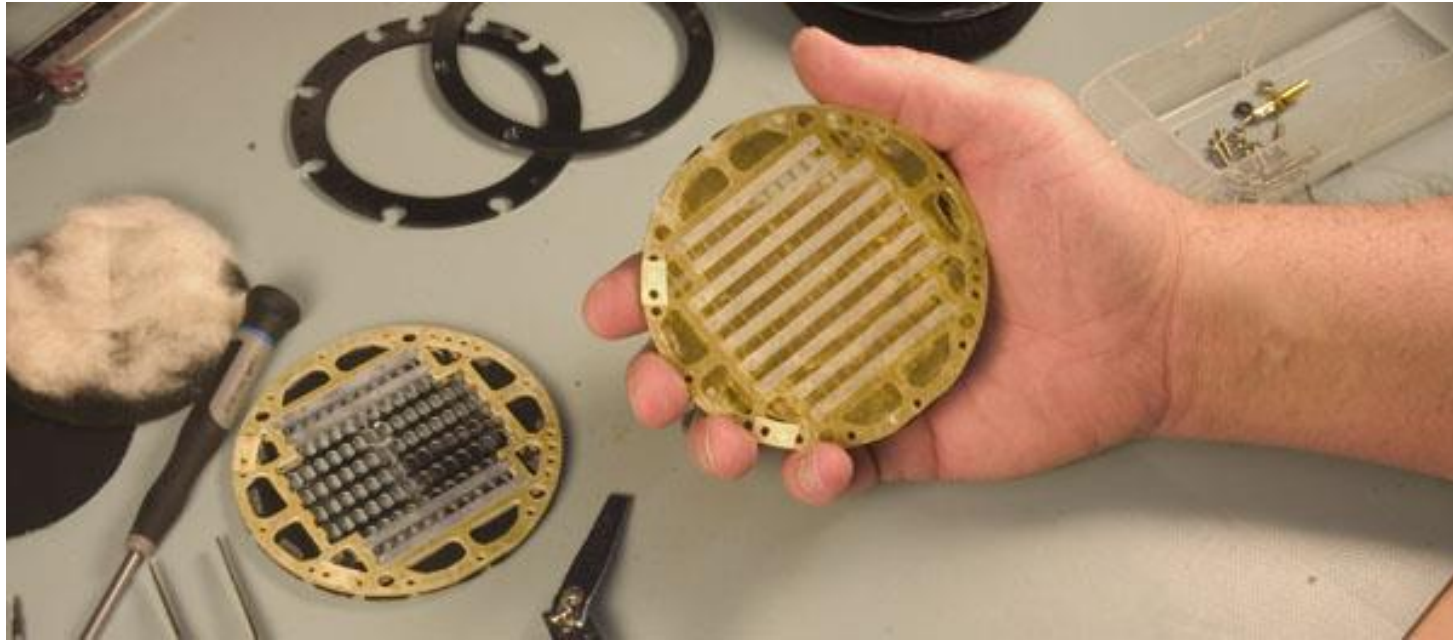


Audeze LCD-3 Magnetic Circuit



Da <https://www.innerfidelity.com/content/how-planar-magnetic-headphone-drivers-work>

Planar Magnetic Headphone



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Planar Magnetic Headphone



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Electrostatic Headphone



Da www.audiosanctuary.co.uk

Electrostatic Headphone

In the great majority of electrostatic [headphones](#), to create the electrostatic attraction and repulsion that makes the diaphragm move, the diaphragm itself must hold steady a static charge of several hundred volts. There have historically been two ways of doing this:

(1) externally via a small high-voltage DC power supply fed down the headphone cord-- this explains why a 'stat headphone's plug has more than 3 conductors.

(2) the diaphragm can be made of a polymer that will hold a permanent electrostatic charge ([Mylar/Melinex](#), the diaphragm material of choice, is not suitable, unfortunately); in other words, the diaphragm can be an electret. This simplifies the design of a 'stat somewhat and allowed manufacturers to market what we might call Stats For The Masses from the late '70s until about 1990.

Both types are true electrostatics.

All electrostatics require that a normal audio signal be increased from around 20 volts peak, which is suitable for speakers, to anywhere from 300 to 600 volts peak. This can be done passively with transformers (which have to be of very high quality) or actively with tubes or transistors. The choice of which to use depends entirely on the cost point that has to be met by the manufacturer; you can drive an electret 'phone from an expensive 'stat [amplifier](#) like Stax's SRM-717 or from a little inexpensive transformer box like Stax's SRD-4. You can drive an expensive 'phone like the SR-404 from that same SRM-717 or from a much cheaper high-bias transformer box like the SRD-7 Pro.

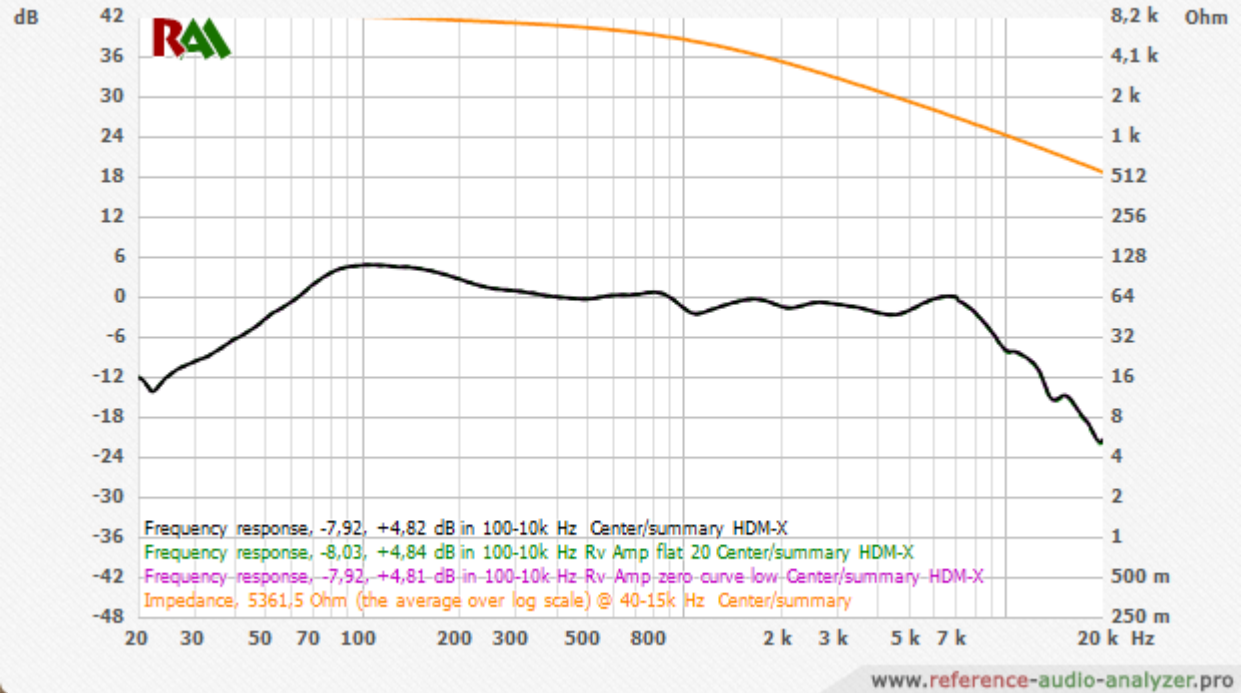
Manufacturers have built transformers into both types of headphones to make them able to plug into normal headphone jacks, with more or less success. Philodox's AKG K340 has little transformers in its driver cups; they can be little because they only have to handle signal from 4kHz up. Philips, Audio-Technica and Toshiba have made fullrange electret 'stats with the transformers built into plugs, driver cups or inline pods. Finally, I've seen no evidence that electret 'stats "lose charge" and become "inoperable" over the course of a human lifetime. I have several electret 'phones that are going strong after 30 years. Consider also that the electret mics built into your parents' old landline telephones are likely to have been giving faithful service despite being spat into for at least a couple of decades.

<https://www.head-fi.org/threads/electret-vs-electrostatic.200922/>

Piezoelectric Headphone



Pioneer SE 700 - Frequency response & Impedance



Da <https://incessantpain.neocities.org/se700.html>

Vedere:

- [Tyll Hertsens](https://www.innerfidelity.com/content/how-headphone-dynamic-drivers-work) How Headphone Dynamic Drivers Work
<https://www.innerfidelity.com/content/how-headphone-dynamic-drivers-work>
- [Tyll Hertsens](https://www.innerfidelity.com/content/how-planar-magnetic-headphone-drivers-work) How Planar Magnetic Headphone Drivers Work
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