Pentode Based Current Drive Amplifiers

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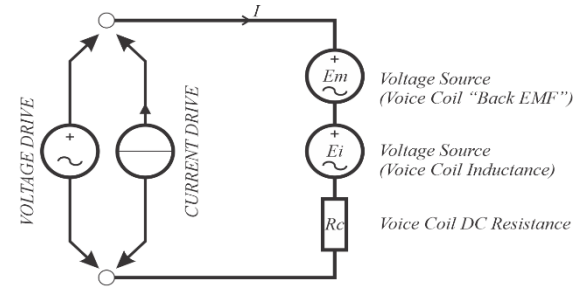
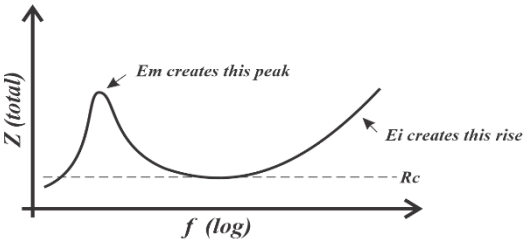


Equivalent Circuit - amplifier/speaker



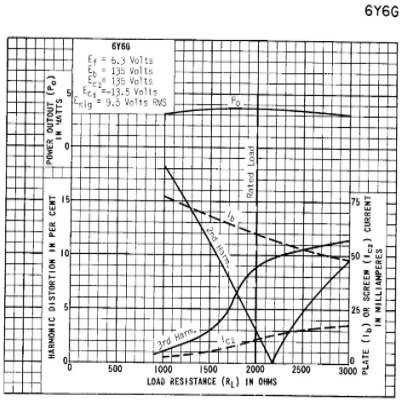
Loudspeaker Impedance Modulus Curve

At La Dolce Audio (LDA) our motto is "if it sounds good, it is good." We make single-ended pentode-based current drive amplifiers that sound different, because they are different. Current drive amplifiers are unusual as they exhibit the unique trait of decreasing the non-linear relationship between the amplifier and the voice coil. When current drive is properly applied you get a wealth of detail, exceptional dynamic range, and a sense of musical "realism" that you don't often hear from conventional voltage drive amplifiers.

CURRENT DRIVE

A current drive, or transconductance, amplifier is a power source that responds to a load by delivering a proportional output current, rather than a proportional output voltage. This approach is a significant alternative to traditional voltage drive amplifiers and is particularly beneficial for high-sensitivity speakers. Precise control of the output current to the voice coil eliminates back signal (return-EMF) to the amplifier and increases the speaker's dynamic response.

A current drive amplifier delivers its output current with a high output impedance relative to the speaker's impedance. By delivering a precise amount of current to the voice coil, the variable impedance of the series circuit (such as the voice coil's resistance, inductance, and the speaker wire) does not affect the linearity of the output signal. Unlike a traditional voltage drive amplifier wherein output and signal degradation is affected by the impedance of the speaker circuit, current drive amplifiers provide a controlled current proportional to the amplifiers input, resulting in a more consistent output regardless of impedance changes in the speaker driver.



PENTODE DESIGN

LDA uses pentode vacuum tubes in a single-ended design rather than the more conventional single-ended triode. Pentodes give LDA amplifiers more control over the harmonics that are generated compared to triodes, and while this isn't a "conventional" design choice among audiophile manufacturers, it is a beneficial one.

LDA recognized years ago that we could not eliminate harmonics (which are a form of distortion), so we decided to make them work in our favor. While many will view harmonic manipulation as a disadvantage because it reduces the "accuracy" of the audio signal, we discovered what generations of musical instrument craftsmen already knew… that using harmonics (the

introduction of controlled 2nd and 3rd order overtones) can provide a greater sense of realism in tone, timbre, and imaging.

If you increase the load on a pentode using a lower ratio output transformer (OPT) you get more 2nd order and lower 3rd order harmonics. Conversely, by decreasing the load (increasing the OPT ratio and thus it's impedance) the 2nd order harmonics are reduced and the 3rd order harmonics are increased. Our amplifiers include targeted local feedback switches wherein you can combine multiple feedback loops to change the amount and type of harmonic distortion, and even the phase of the distortion. Thus, the load and local feedback loops provide multiple sonic signature combinations with various effects on not only tone, but also the soundstage and imaging. Each of these effects creates a different playback experience, and for those who want the ultimate control of their tone, these effects can be further controlled by varying the voltage swing across the Pentode when using an output attenuating device such as the LDA HPA2.3.

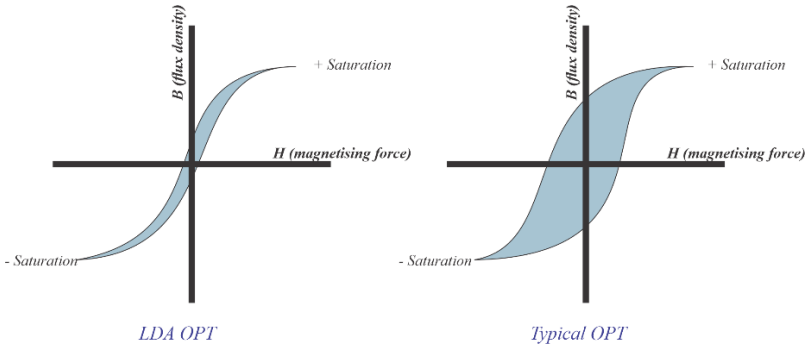
TRANSFORMER DESIGN

At LDA, our innovation extends to the use of a unique amorphous-core material in our output transformers. This allows for linear bass down to 20Hz and treble above 40kHz. No other core material manufactured or sold in the US (that we have found) is able to do this. This amorphous material in the core demagnetizes when voltage is removed which defeats the polar saturation on the back half of the BH curve, before H crosses zero, significantly reducing hysteresis. What you get from this unique transformer is sonic clarity and realism that really needs to be heard to be believed.

B = (Magnetic Flux Density): The amount of magnetic field passing through a given area, measured in Tesla (T).

H = (Magnetic Field Strength): The magnetizing force applied to the material, measured in Amperes per meter (A/m).

Hysteresis: The phenomenon where the magnetic state of a material (B) depends on its past magnetic history, causing a lag between the applied H field and the resulting B flux.



LDA OPT *Typical OPT*

LDA - AMPLIFIER DESIGN FOCUSED ON THE LISTENER

All our amplifiers, from our integrated amps to our monoblocks, use the same current drive, single-ended pentode, amorphous core OPT design. And while audiophiles often buy gear based on specifications, we know specifications don't create an experience. Instead, we focus on the listening experience. These principles allow us the freedom to deviate from the way other manufacturers approach amplifier design. The results are worth a listen.