
# TUNDRA 2.5

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**Tundra: An exercise in precision**

A little known fact about how to achieve the highest possible performance from a HiFi system is that it's **never** about perfecting a single important detail. It's **always** about perfecting as many details as possible. This is true for everything from system installations to the manufacturing of individual HiFi components.

It's not overly difficult to make an amplifier that sounds nice or even spectacular. But to make an amplifier that lets the music reach out and touch you, one needs to optimize every detail and make all parts of the design interact in a fluent, harmonious way. A truly musical amplifier doesn't draw attention to itself. Instead you tend to forget about the system and become immersed in the music.

I started working seriously on power amplifiers in 2010. For some reason, my mind was initially stuck on how a power amp needs to deliver enough voltage and current to the loudspeaker. In other words: **Power**. Nearly all the audio gurus that have put their ideas into print emphasize the power issue of power amps. The name implies it, does it not?. My results with this strategy were not fully convincing. Although the sound was good, the music simply didn't reach out and touch me.

Late in 2010, a seemingly obvious idea struck me: My focus should be on **signal preservation** instead of power delivery. Why? Because the closer to the source, the larger the impact of quality on our musical satisfaction. We'd rather listen to Dylan playing the harmonica in a noisy bathroom, than to a good interpreter of Dylan in a perfectly quiet concert hall. This principle is often called Source First.

This simple change of viewpoint made me look at everything from a different angle. Instead of focusing on the output stage, I put all my efforts into the input and driving stage, attempting to keep the quality of the signal preserved for as long as possible in its journey through the amplifier. Finally, I added an output stage that interacted harmoniously with the preceding circuits.

The first Tundra prototype was born in January 2011.

During 2011, it was optimized in every way I could think of: Currents, voltages, temperatures, layout, connectors, cabling, directions, torques, mechanical issues and damping.
Every critical component was bought in large numbers, then manually measured, one by one, in purpose-built test rigs and divided into many groups with ridiculously small steps in between.
Finally, two musically fine tuned switch mode power supplies replaced the conventional transformers I had started out with.

At first, this extremely optimized Tundra wasn't intended to be released as a commercial product. I considered it too impractical to manufacture (indeed every new batch has turned out to be a real struggle to get perfect). It was rather an exercise in precision, to see how far I could get. But a friend convinced me that I should manufacture and sell it *exactly* the way it was. I am very thankful that he did. The original Tundra was released in April 2012.

**Tundra 2** was the first major upgrade, released in June 2015. It consisted of a 1.1 kg pure copper heat sink (replacing the aluminium one), an incredible new Japanese Thermal Interface Material, two new filter capacitors on the input and a new chassis ground design.

**Tundra 2.2**, also called the TARANDUS upgrade, was released in January 2017. It included improved filtering of power lines, starting at 0.9 instead of 5 Hz, and the addition of a new circuit that keeps idling currents more stable.

**Tundra 2.5** was released in June 2018. It has two capacitors changed to a new high frequency ultra precision type. These sound better and perform more consistently than the model they replace.
Tundra 2.5 also incorporates a Status Port on the rear panel, with which you can measure the main idling current. Next to the Status Port is a Trim knob, where you can fine tune the main idling current to the optimal value. This feature makes Tundra 2.5 perform optimally, regardless of room temperature and how well ventilated its position is. It also compensates for the very slow but inevitable drift of circuit values over time (years).