

The story of the 9-volt battery
As remembered by Rick Washburne

The original design for the SID Symphony Stereo Cartridge was created with the knowledge that the SID chip needed +5V (available on the cartridge port) and +12V (good luck). Someone immediately pointed out to me that another version of the chip was available needing +9V instead of the +12V, so I (almost) jokingly suggested we just design it with a battery. I then went to work to create a voltage doubler circuit to turn the +5V into +10V and back it down with a Zener diode and a current-limiting resistor.

It didn't work.

I immediately and closed-mindedly jumped to a most arrogant and ignorant conclusion in two parts:

- There wasn't enough current at the port to power the chip and the doubler (formula calculations be damned) and/or
- My textbook that presented the doubler circuit was wrong

So I jumped back to the battery design and Rev 1 was born.

Many carts and weeks later, someone (maybe Craig?) said, “Hey, why not just use a voltage doubler circuit?” I giggled to myself and proceeded to demonstrate what a stupid, ignorant, uninformed question this was. I built the circuit on my newly-purchased breadboard, hooked it to the sacrificial C-64 that had wires tacked to each of the cartridge connection signal lines, and flipped it on smugly to show the abject failure of the circuit, witnessed by a voltmeter reading a significant lack of doubled voltage...

...and it read “+9.002” and the circuit worked fine.

((@*#)(@*(@#*\$*(#\$\$%#@!!!. Probably something to do with the old breadboard I used last time, which I threw away due to open connections that almost cost me a perfect lab grade in EET255.

Almost...

Now, in my defense, the author of the textbook that I thought was inaccurate was penned by a professor who told us in lecture that ten-to-the-eighth-power was equal to infinity. One might argue that this is perhaps a reasonable conclusion in electronics, such as when discussing resistance, but this equates to 100M Ω and while I concede that anything over 33M Ω is not easily purchased and has questionable usage as a reliable component, large resistance components do exist and can be measured with the right equipment. The professor's statement always bothered me, since he said “equal to” instead of “could be considered.” And since I'm the smartest man on Earth (no, don't bother to check my grades—just trust me) this meant that EVERYTHING he ever wrote or said had to be the opposite of truth.

We were so cute at that age...

Anyhow, version 2 was born.