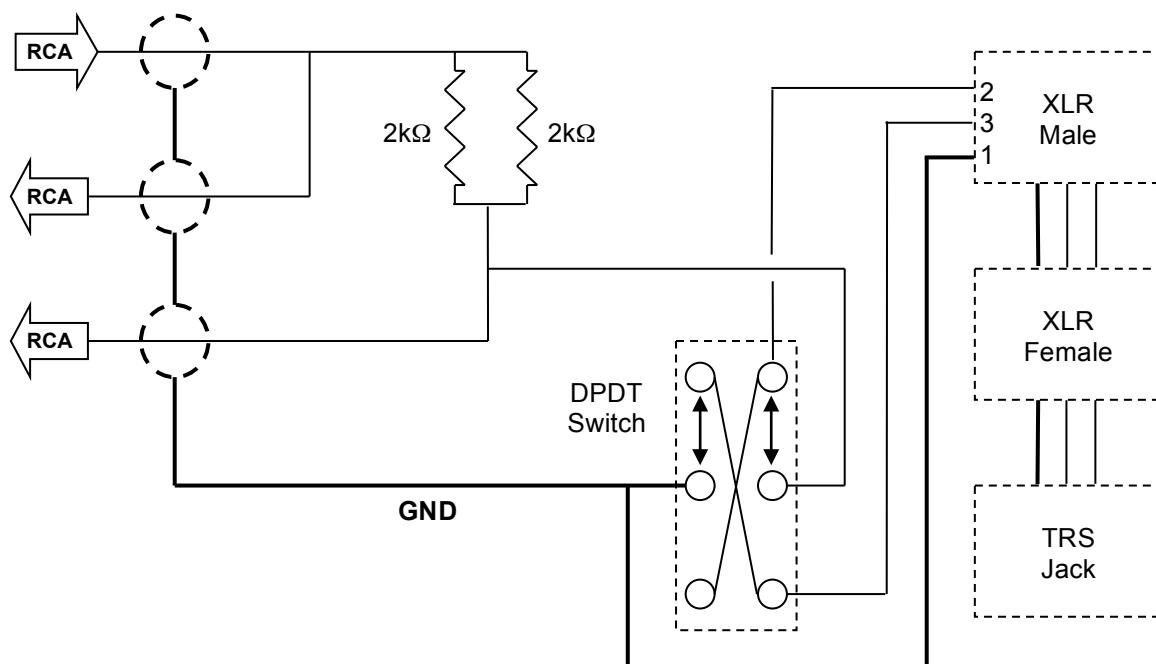


Smaart ZBox



Notes

1. SIA Smaart v5.x with linear amplitude scale can be used to measure impedances of loudspeakers as well as input and output Z of audio electronics.
2. Parallel $2k\Omega$ resistors used for pseudo-constant current source that is an easy load for any audio interface to drive.
3. DPDT switch allows measurement of balanced inputs and outputs by switching between pin 2 / tip or pin 3 / ring while shunting the other side to ground.
4. When calibrated with a 200Ω resistor, this setup produces reasonable accuracy below 500Ω . For higher impedance measurements Smaart is useful to spot trends across the frequency range of interest, but for accuracy you'll need to load the ZBox returns with a much higher input impedance than that of a typical audio interface.
5. Smaart does not plot impedances higher than 250Ω by design, though the values are still displayed numerically when you move the mouse horizontally through the graph area. You can get the higher Z's to graph in Smaart if you lie to it by calibrating to a $1k\Omega$ resistor and telling Smaart the resistor is only 100Ω .

Applications

1. I have found significant differences between manufacturer impedance specs vs. actual. The Alesis HD24 EC-2 hard disk recorder spec's $10k\Omega$ for its balanced inputs, but measures $50k\Omega$. The Sony SRP-F300 loudspeaker processor publishes a 47Ω balanced output Z, but actually measures only 2.4Ω .
2. It is interesting to see pin 2 vs. pin 3 differences on "impedance balanced" outputs. Some manufacturers match the resistor in series with pin 3 closely to pin 2's active output and some don't. The Allen & Heath GL3300 console demonstrates examples of both on its TRS output jacks. The channel "direct outputs" have resistors on the "rings" that are within $\frac{1}{2}\Omega$ of the active "tips", but the TRS outputs in the console's main output sections are poorly matched, differing by as much as 30Ω . It is also interesting to see the TRS insert jacks' input vs. output Z with the flip of the switch. I found that the GL3300 insert jack return (ring) Z is a rather low $3k\Omega$ ($2.5k\Omega$ with the EQ switched out), which could be a little rough on some effects units.

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