

HiFiCollective Shunt Attenuators – Shunt Resistors Comparison

Neville Roberts

A shunt attenuator consists of a single, fixed series resistor and a range of shunt resistors to select the attenuation required. With a wide choice of audio-quality resistors available, how do they compare? Neville Roberts tries out three different makes of shunt resistors.

A shunt stepped attenuator is a simple design where the signal is fed through a fixed series resistor (R_x in Figure 1) and the shunt resistor, R_y , is selected from a range of values ranging from zero to infinity by means of a selector switch. Although a shunt design presents a variable input impedance to the signal source, this has little effect in practice and the benefits of a single resistor and switch in the signal path far outweigh any potential matching issues.

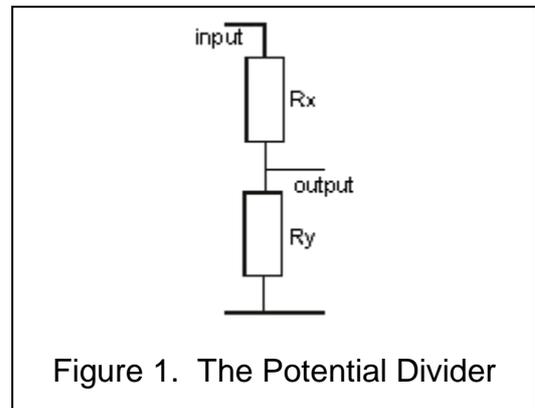


Figure 1. The Potential Divider

HiFiCollective offer a good range of audiophile-quality resistors that are ideally suited to the construction of a quality stepped attenuator. Each type of resistor can have a different sonic effect and this review compares the effect that three different types of shunt resistor (R_y in Figure 1) can have on the sound.

The series resistor R_x was the top-of-the-range 47K ohm, 0.4W Charcroft Z-Foil audio resistor. The three makes of resistor chosen for the comparison are the $\frac{1}{4}W$ PRP (Premium Resistive Products) PR9372 audio grade metal film, the $\frac{1}{4}W$ Takman carbon film and the $\frac{1}{4}W$ Takman metal film resistors, each supplied in a range of differing values to enable adjustment within comfortable listening levels.

The first attenuator to be tested was wired with PRP PR9372 shunt resistors. With the Charcroft as the all-important and critical series resistor, the sound was deliciously open and detailed with a bright and full sound, coupled with fantastic imaging.

Changing to the $\frac{1}{4}W$ Takman carbons with the Charcroft remaining as R_x , the sound quality was actually very similar although there were some discernible differences. The Takman carbons sounded every bit as good as the PRPs and somehow clearer, offering a slightly more refined sound showing itself in the string sections of an orchestra being marginally more well-rounded.

Finally, switching to the Takman metal films, these also performed admirably and I had to repeatedly swap between the three different makes to identify the subtle differences. In the end, I concluded that the Takman metals scored over the other two by adding better depth and imaging to the overall sound. In particular, when playing some dance/trance music (Laurent Garnier's "Tales of a Kleptomaniac"), the sound was clear and the massive techno bass achieved incredible control and tightness without any sense of being unnecessarily restrained. However, this in no way swamped the clarity of the triangle, tinkling away at the top end!

So, to summarise, the shunt resistors do not, in my opinion, make a huge difference to the sound quality (unlike the series resistor, which is the subject of a separate review). However, there are subtle variances and I would personally put the Takman metal films at the top of the list, followed by the Takman carbons and then the PRPs. Interestingly, I only checked the prices of each resistor after conducting my tests and I see that my ranking also directly corresponds to the price! Having said all that, it really does boil down to budget and I would make a priority investing in the series resistor before choosing the shunt resistors to fit in with the remaining funds available.

--ooOoo--