

Re-designed Vacuum-Tube PreAmps Take Audio to the Next Level



JHK Audio uses industry-leading Bulk Metal[®] Foil technology to create even darker audio backgrounds and provide superior audio performance in high-end audio devices that are designed to satisfy the demands of the most sophisticated audiophile.

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Company/Institute: JHK Audio

Industry/Application Area: High-end Audio

Products used:

- [VAR, 10k ohm, 0.01% tolerance](#)
- [Z201, 100k ohm, 0.1% tolerance](#)
- [S106D, 1M ohm, 0.1% tolerance](#)

The Challenge

The audiophile community constantly seeks improved sound. One way to improve audio performance is to eliminate “noise”, which helps to produce a darker background. Achieving a lower noise-floor means the result does not obscure the music and enables the listener to hear delicate musical details. Many components, including preamps and amplifiers, produce a certain amount of background noise.

Heat generation naturally occurs during normal and prolonged operation of a preamp, so reducing thermal noise will reduce the noise floor.

The Solution

A re-design of the classic JHK Vacuum Tube Preamp included use of Vishay Foil Resistors’ S series with Bulk Metal[®] Foil technology in combination with its VAR series Z Foil Audio Resistors. Noise and distortion in the signal path, as well as resistance instability over temperature, were minimized. The result created an improvement to the “dark background”, allowing music to be heard as originally mastered.

The User Explains

By their inherent nature, vacuum tubes produce copious amounts of heat. As a result of coupling extreme heat and typical supply voltages of 250 VDC, a traditional carbon-based resistor's flaws become readily apparent – as noise due to temperature instability. In such an environment, the characteristics of resistors with Bulk Metal® Foil technology clearly address the temperature challenges and deliver a much-appreciated audio enhancement.

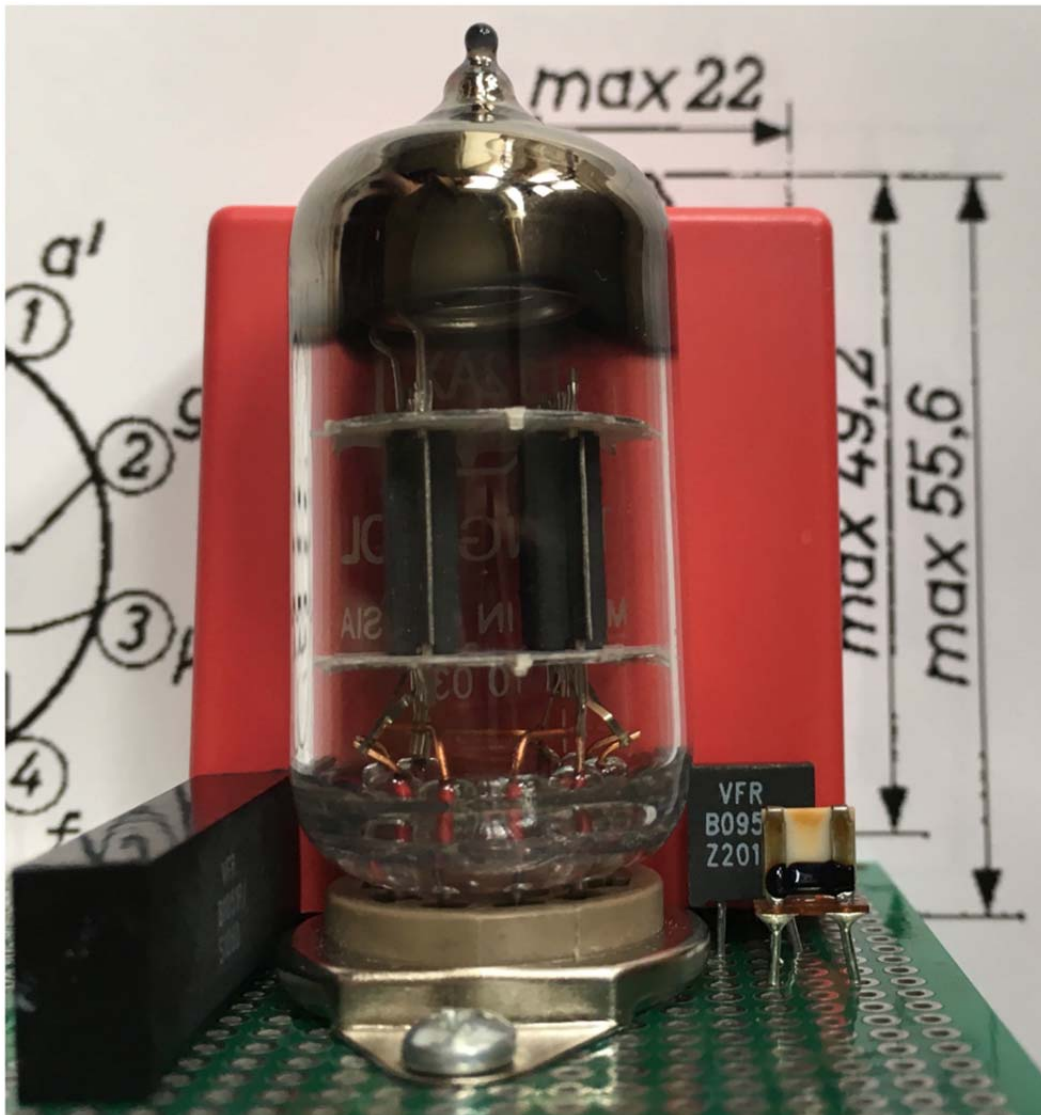


Fig 1: A JHK vacuum tube with a Vishay Foil Resistor VAR series Z Foil Audio Resistor

As noted, carbon-based resistors are inherently noisy devices. Thick and thin metal film devices are a better choice in vacuum tube circuits because they have better thermal profiles than their carbon equivalents. These types of resistors still have known limitations and exhibit resistance variations



due to thermal conditions. Our solution for the discerning audiophile was to leverage the best resistor possible. That is why we chose Bulk Metal[®] Foil resistors.

Besides unequalled performance, Bulk Metal[®] Foil Resistors allow specification of optimum resistance values for precise in-circuit requirements, delivering even better results in the end product.

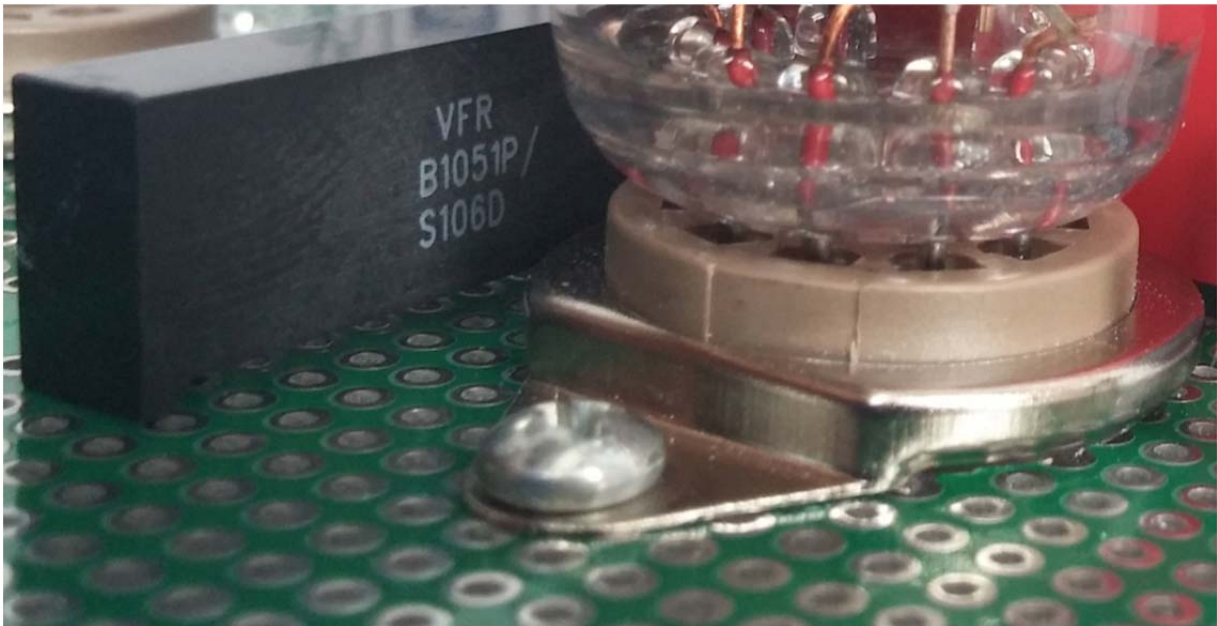


Fig 2: A JHK vacuum tube close-up, with the Vishay Foil Resistors S series with Bulk Metal[®] Foil Resistors technology

“Excelling through low noise, low inductance and low capacitance, paired with high resistance stability over temperature and time - Bulk Metal[®] Foil resistors enabled JHK Audio to take our designs to the next level and create an unique offering every audiophile will enjoy.”

Acknowledgement:

JHK Audio designs and manufactures custom preamps and amplifiers for discriminating audiophiles.



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