

Switched (Stepped) Attenuator Passive Volume Control



Author Nick Lucas, Managing Director at Hi-Fi Collective

Hi-Fi Collective designed a switched attenuator passive volume control with unrivalled performance for its customer Glasshouse in Australia.

Industry/Application Area: High-end hi-fi

Products Used:

Vishay Foil Resistors (VFR) Bulk Metal Foil high-precision Charcroft Audio Resistors (CAR) from Charcroft Electronics

The Challenge

Recently, Nick Lucas, Managing Director at Hi-Fi Collective in the UK, was asked by an Australian customer to design and build a high-performance ladder stepped attenuator for a high-end hi-fi volume control. This was managed under the Glasshouse brand name.

The Solution

The first decision was to select a resistor to use. With his many years of experience with VFR Bulk Metal Foil resistors and knowing of their low noise, wide dynamic range, and low temperature coefficient, Mr. Lucas chose to use CAR resistors from Charcroft Electronics. Charcroft is an authorised distributor and precision centre for VFR. At its precision centre in Wales, Charcroft manufactures VFR resistors under licence, including the CAR range of audio resistors. During the manufacturing process, each individual resistor is trimmed to any desired six-digit resistance value from 10 Ω to 100 k Ω .



The User Explains

Mr. Lucas says, "After being approached by a customer who was keen for us to develop a no-holds-barred stepped attenuator for his system, my first thought was Charcroft Audio Resistors. I could think of no other resistors out there that are close to the neutrality and detailing that the CAR foil resistors possess. My customer was keen to go for a ladder stepped attenuator, which is an attenuator where each step uses a unique pair of resistors to form a voltage divider. Thus the impedance is constant through the sweep. As the customer required a 100 k Ω version, we were able to accommodate this with the values we stock. However, this project has inspired us to order another 52 values so we could make more versions available. We went for the Japanese Seiden 4-pole, 23-way switch to stay in line with the quality of the Charcroft parts, together with pure silver wiring. Needless to say, the sound was out of this world, which can be attributed to the 0.1% tolerance of the CAR foil resistors. Incredible detail shines through with a distinctive silence about it. Truly superb!"

And the result? To quote Mr. Lucas: "It's amazing; this pot produces the purest sounds I've ever heard."

glass*house

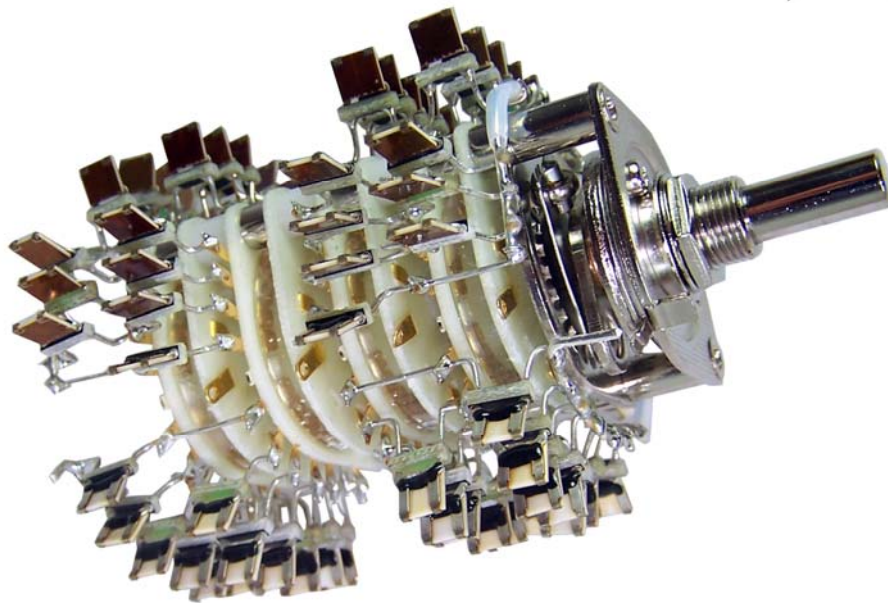


Figure 1: Switched (stepped) attenuator passive volume control using CAR foil resistors



**“With their low TCR, thermal EMF, and noise,
VFR Bulk Metal Foil resistors helped Hi-Fi Collective
achieve unrivalled performance with its new switched
attenuator passive volume control designed for
Glasshouse in Australia.”**

Acknowledgement:

Charcroft Electronics Ltd.

Charcroft Electronics Ltd is a privately owned company founded in 1974 in Suffolk UK, which moved to its current location in Powys, Wales in 1985 where its offices, warehousing and manufacturing facilities are all located. As a passives specialist, Charcroft holds both distribution and manufacturing approval to BS9000 and IECQ-CECC and has been producing precision resistors since 2003. The company's team of just under 50 employees, many of whom have been with Charcroft well over 10 years, have a wealth of knowledge in passive components. www.charcroft.com

Charcroft Audio Resistors: http://www.charcroft.com/charcroft_manufacturing/charcroft_audio_resistors/

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Hi-Fi Collective

Hi-Fi Collective is a UK-based designer and suppliers of hi-fi components. Whether you want to build your own valve amps from scratch, dabble in speaker design, or tweak components, Hi-Fi Collective is a great source of knowledge and resources. Nick Lucas (Managing Director) cut his teeth in the DIY sector working for World Audio Design and managed the kits division of Hi-Fi World Magazine for 10 years. Hi-Fi Collective Ltd started trading in May 2003 and has grown steadily ever since with a simple ethos close to our hearts - offer customers a wide range of products and dispatch them immediately. www.hificollective.co.uk

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