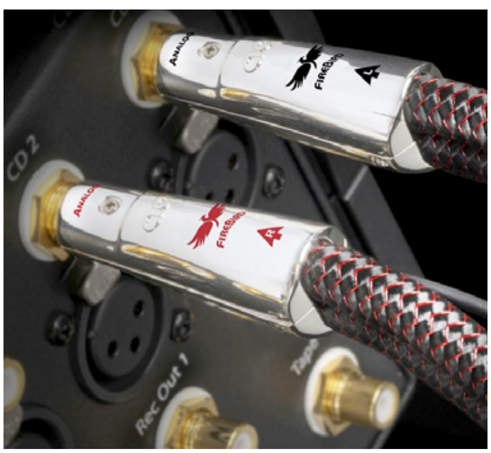

AudioQuest Mythical Creature Analog Interconnects:

A Technological Leap Forward

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With more than 40 years of experience in cable design, Bill Low and AudioQuest set a very high bar for analog-audio interconnect technology and performance, previously introducing critically acclaimed products such as Fire, Wild, and our former reference, the WEL Signature.

These designs built on many hard-won technologies and materials, from Perfect-Surface conductor metals to Triple-Balanced topology, FEP Air-Tube dielectric materials, Direction-Controlled conductors, and our patented 72v Dielectric-Bias System (DBS). In addition, great attention was given to noise dissipation via multiple layers of conductive carbon and aluminum foil shields. All these things and more were combined to create a standard, or reference, that was as close as we believe anyone had come to our laboratory test ideal, no cable — for practical purposes, a very short jumper of the best quality conductive material possible.

Exceeding this level of performance required a fresh approach. Though we had a great foundation of materials and tools upon which to build, no assumptions were made that what was created for our previous interconnects (or the Mythical Creature speaker cables and Storm Series AC power cables) could simply be transferred or carried over to this application.

When we investigate the strengths and shortcoming of an interconnect, it's best to get back to electrical basics. In the high-performance audio industry, it's typical to exploit the exotic. However, the circuitous route is rarely the most productive or practical. Instead, we must get to the root of the issue. We must ask: *What are the fundamental issues at play with an analog interconnect?*

Basic engineering shows us that crude topologies and materials will pass so-called "audio frequencies," as measured by any respectable laboratory. This is one of the key reasons the performance-cable industry has often been scorned by skeptics (sometimes deservedly so). The problem is that many of these laboratories lack the equipment to properly assess the products under test.

Going deeper, we must ask: *Does the test performed in said laboratory adequately show what the cable, circuit, or device under test will do in a real-world system playing music?*

The answer is typically no.

This is not to say that basics such as circuit shunt capacitance, series inductance, and resistance have no value. However, running a sweep of frequencies at a relatively high signal level, through a test bench's matched impedance (source and load) — without complex, wide dynamic music signals interacting with real-world circuits — simply can't reveal enough. In such an environment, nearly everything appears to be acceptable.

Real-world analog audio circuits virtually never have matched impedance at the source and load, and none of them behave that way at radio frequencies. This is key: In today's environment, we are besieged with radio-frequency (RF) induced noise. This has always been true, but not to the extent presently experienced, and not to the extent where noise signals can be so very small that capacitive coupling renders basic filter circuits, chips, and components to be increasingly limited in their ability to dissipate enough of this induced noise.

Further, in some applications, these laboratory instruments have become worse at their intended jobs. The Audio Precision, for example, is a fabulous digital test instrument, respected industry-wide for its ability to provide insight into the performance capabilities of many audio circuits and components. However, its design inherently limits its high-frequency sensitivity to well below 500kHz. This is just below the AM radio band! Analog test benches could have been much better in this regard, but most tests were done with both high- and low-frequency filters in place. Why? To get consistent readings, and because almost nothing does well when all the induced noise is shown. This is a dirty secret of electronic design that goes back many decades. It's fair and credible, in that every technician/engineer essentially did the same thing.

However, if we wish to make technological strides forwards, we must see, acknowledge, and consider the full extent of the problems in play (warts and all). We must accept that there is simply too much induced noise to fully dissipate. Rather, we will need to both dissipate and drain the noise in the most efficacious way possible — *and* in the most even, consistent, or linear means possible.

There are significant factors working against us. As previously stated, real-world source and load circuits have unmatched circuit impedance. Typically, impedance is not linear at radio frequencies. Complicating matters, these issues are exacerbated by a cable's own characteristic impedance. To be fair, this is a minor issue at audio frequencies along relatively short lengths, but it's a significant issue for induced RF noise and with regards to the ways in which the primary music signal can suffer from transient intermodulation and masking effects at low signal level (via the induced RF noise).

The characteristic impedance (ie, 50, 75, or 110 ohm) of an interconnect cable has to do with the geometric spacing of the topology's high- to low-signal conductors and their dielectric constant. (It has *nothing* to do with series resistance, by the way.) These designs go back to broadcast radio and video — specifically, transmission lines. When matched with source and load electrical circuits of the exact same impedance, many inherent losses and distortions are either eliminated or greatly reduced. However, for many reasons that are both practical and directly related to circuit performance, that idea was abandoned by most of the audiophile industry almost from the beginning.

So, would there be any benefit in eliminating (as best we could), the cable's characteristic impedance? Absolutely! Could it be done? Yes — the issue is markedly reduced by eliminating the cable's dielectric constant via 100% electrostatic shielding. ZERO-Tech (no characteristic impedance) is a technology that I developed for AudioQuest's Storm Series of AC power cables as an offshoot of technologies developed for our Niagara Series power products. In those applications, the fundamental issue was minimizing any distortion or compression of transient current. For an analog interconnect, no such issue exists. However, the need for predictable linear behavior is still paramount. In fact, it's even more vital as the primary audio signal reaches far lower into the noise-floor.

By stabilizing this fundamental portion of virtually any cable (even some very exotic ones), we lower distortions within very low-level audio signals when connected within an audio system. Further, this allows us to significantly refine our Noise-Dissipation Technology. With more linear, predictable behavior, we are able to incorporate fewer layers of shielding, and to greater effect, thanks to carefully combined mixtures of conductive carbon and graphene, in conjunction with a more optimal application of our filtered 72v DBS. This is because low-loss dielectric materials can work for or against you. When considering their efficacy within the circuit, we must ask: *Is the dielectric shunting the load? Is it distributed capacitance?* All these criteria must be considered and dealt with accordingly.

Lastly, for quite some time, we had been using very large and costly AC power amplifiers to linearize and contact-burnish our Niagara and DBS filter capacitors. Although an interconnect cable has different properties from these other devices, some of their issues are very much the same. While our industry commonly acknowledges the benefits of running-in a cable or audio component, our research showed that typical run-in may not be enough to achieve our desired level of performance.

Through considerable testing and work, we have created a repeatable method for establishing a level of *Permanent Molecular Optimization* of both the cable contacts and the dielectric, the effects of which no existing system or method could possibly achieve after any length of time. The process optimally stresses the associated materials in a fashion similar to the purposeful run-in of a fine race engine or the concentrated exercising of a competitive athlete's muscular and cardiovascular systems.

There will be those who will wish to "see this for themselves" via typical audio test-bench measurements. I could make the philosophical choice to state, "It's what you hear in a real system that matters." And while that's ultimately true, the efficacy of our design can in fact be tested. It simply requires a process such as the one already in place for the Niagara Series power products — a digital difference or "differential" test. This shows the difference signal generated from a real system (source to loudspeaker interacting together) and can be broken down with spectrum analysis. A typical "cable" test with a single frequency sweep or sine and square waves is mostly useless. For samples of these tests and further information, see and download Power Demystified from the AudioQuest website's Niagara section.

There are many small but significant refinements that were employed in the AudioQuest Mythical Creature Series of analog-audio interconnects, along with a dedicated crew of individuals that aided in their development. Technological leaps are never an accident. They are the product of painstaking work — meticulous research, thorough testing, careful listening, and vast experience.