

# AudioQuest - Mythical Creatures and Folk Heroes Speaker Cables



## Killing the Noise

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### Distinguishing Technologies

- ▶ **ZERO** Technology: No Characteristic Impedance
- ▶ **GND** Technology: Optimized Ground-Noise Dissipation (Bass/Midrange cables – BASS models only)

### Abstract

Today's hyper connected environment contains far too much radio-frequency (RF) noise for the faithful music reproduction. By employing linear noise-dissipation across a wide range of frequencies, we can restore the critical low-level audio signals that are typically masked or distorted by radio-frequency noise.

### Methodology

- **ZERO** Technology eliminates the interaction between insulators for the cable's positive and negative conductors, thereby ensuring no characteristic impedance, which, in turn, enables the transfer of uncompressed current, and more linear (even) noise-dissipation.
- **GND** (Ground-Noise Dissipation) Technology (for BASS models only): Highly effective noise-rejection technology works linearly across more than 12 octaves of induced radio frequencies and reduces transient intermodulation distortion to the connected power amplifier.

### Background

#### **ZERO Technology:**

Despite great advancements in today's power amplifier and component technologies, they alone cannot fully address the challenge brought by today's extraordinary levels of radio frequency noise. Low-level audio signals are masked and distorted by very small and insidious noise frequencies from cellular towers, Bluetooth, and satellites. These ever-present induced noises have rendered both traditional and audiophile speaker cable designs inadequate or lacking.

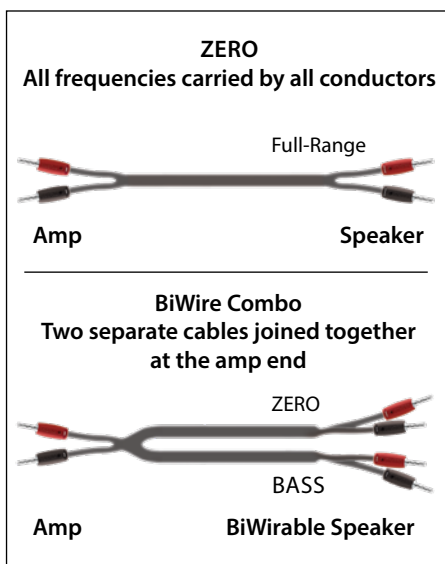
To ensure consistent or linear noise-dissipation in a speaker cable and across the greatest range of frequencies, we must eliminate the portion of the cable that resists linear operation or consistent noise cancellation. That would be the cable's characteristic impedance. AudioQuest's ZERO Technology eliminates the characteristic impedance entirely, while our GND Technology for BASS (Bass/Midrange) cables (for those who bi-wire or bi-amp), carries linear noise-canceling and dissipation even further. Far greater resolution, far less distortion.

By eliminating the cable's characteristic impedance and by significantly reducing transient current compression, we are able to ensure vastly improved dynamics, audio transient reproduction, and bass slam.





The new Mythical Creature and Folk Hero ZERO speaker cables may be used in one of two ways: either as ideal Full-Range cables, or, in combination with a dedicated BASS cable, to create a high-performance BiWire COMBO. All Mythical Creature and Folk Hero BASS cables incorporate GND, AQ's patented noise-rejection technology that reduces transient intermodulation distortion to the amplifier—another compelling reason to BiWire or BiAmp whenever possible.



### GND (Ground-Noise Dissipation) Technology:

We have long declared that cables are just as important as any other component within a system. Never has this been truer than now. It is time to revise the ways in which we think and talk about speaker cable. Our well-worn assertion that a cable, in and of itself, cannot improve the sound of a system is no longer an absolute.

Though this is still a baseline truth, with technologies such as our patented GND (Ground-Noise Dissipation), we can create a high-frequency, low-impedance path that dissipates and drains away induced radio-frequency noise. This parasitic noise can couple to the primary audio signal, and that creates additional transient intermodulation distortion in many power amplifiers. GND technology is featured in all BASS model (Bass-Midrange) cables.

### Distortion in Speaker Cables

#### Past:

Premium speaker cables have been able to faithfully transmit audio frequencies with minimal phase distortion for decades (at least when measured at 0dBu). However, the induced noise from today's radio frequencies, which are higher in actual frequency, smaller in physical size, and far more prevalent than ever before, creates

## **ZERO (No) Characteristic Impedance Full-Range or Treble**

Positive (red) and negative (black) signal conductors are electrostatically isolated.



both masking and distortion of critical low-level audio signals. These sub -60dBu audio signals contain much of the music's air and reverberation as well as many of its highest frequencies, micro-dynamic audio transients, harmonics, and important cues that determine instrument placement.

Traditional speaker cables never attempted to drain, trap, or dissipate induced RF noise, as the load impedance was very low, and the source output level was quite high (+20dBu for .775V input, nominal). However, with the proliferation of Bluetooth, cellular towers, and an increase in the number of deployed satellites, such nullifying factors can no longer be taken for granted. Today's induced RF noise can mask or eliminate a great deal of low-level audio signals, and it can also create transient intermodulation that causes an audibly annoying edge, ringing, or harshness when these noise signals intermittently mix with transient audio signals.

The restriction of transient current, which gives the audio signal its immediacy, impact, and bass slam, is another limitation of traditional and audiophile speaker cable technology. This limitation can occur because the characteristic impedance of the cable is frequently lower than that of the loudspeaker(s) at resonance, and, as the speaker is rarely one impedance at all frequencies, its interaction with the speaker cable will vary frequency by frequency, and with varying drive levels. This creates distortion.

### **Present:**

We cannot hope to match the source and load impedance of the amplifier and the speaker as would be required for a classic transmission line cable (and we would lose half the power and all of the amplifier's damping factor if it were attempted).

So, the best means of eliminating the inherent problems with the cable's characteristic impedance is to simply get rid of it. This is precisely what has been done with AudioQuest's ZERO Technology. ZERO Tech ensures no characteristic impedance, as we have eliminated the interaction of the insulators (or the dielectric constant), from the cable's positive and negative conductors.

By doing so, we are afforded uncompressed current transfer. Transient current transmission is now limited only by the DC resistance and length of the cable, and RF noise-dissipation that is linearized (i.e., made more consistent octave by octave).

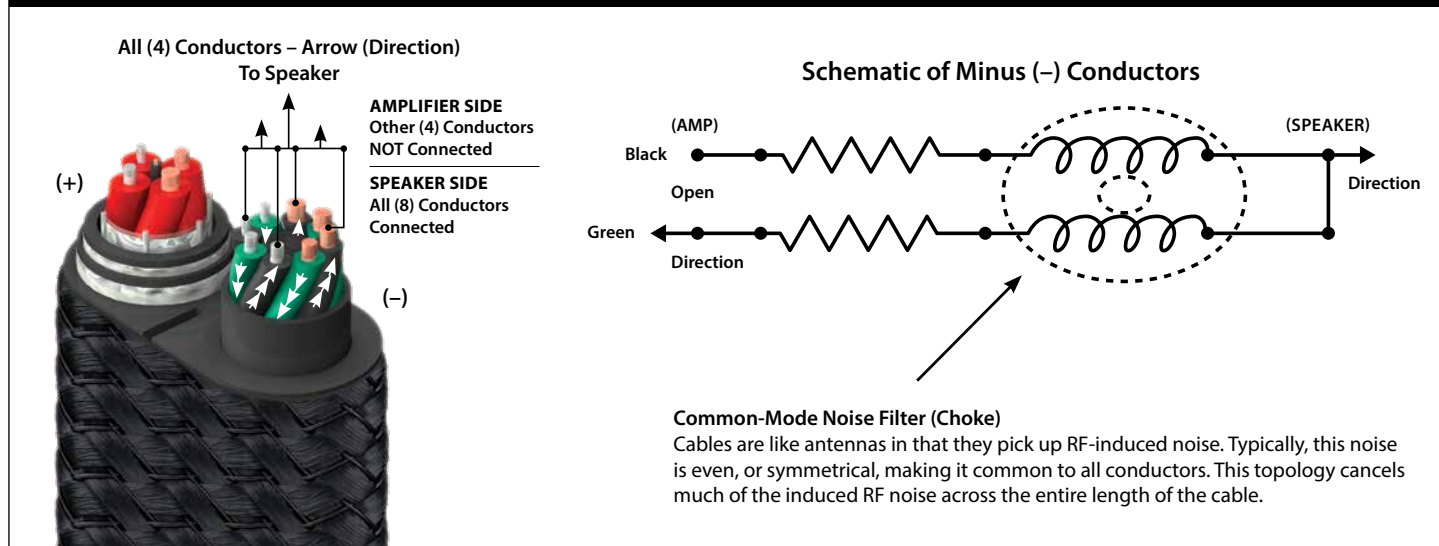
## **Ground-Noise Dissipation (GND)**

### **Bass/Midrange Cables – BASS models only**

For those who can bi-wire, bi-amp, tri-amp, and so forth, our new GND Technology takes linear noise-dissipation steps beyond. By utilizing a portion of the technology developed for the Niagara AC power products (Ground-Noise Dissipation; US patent #9,373,439), we have developed a highly efficient noise-canceling circuit that works linearly across more than 12 octaves of induced radio frequencies.

Further, any cable construction that utilizes a circuit card, micro-chip, or phasing filters in a box in an effort to reduce RF noise cannot be linear, or nearly as effective at doing so. To an extremely small (2GHz) induced noise signal with a sine wave of less than 4 microns (0.004mm), the remaining length of cable (after the small circuit or box), might as well be a kilometer. AudioQuest's GND technology works across the entire length of the cable, assuring consistent results.

## BASS (0Hz – 10kHz)



### Notes for proper implementation of BASS and ZERO cables in audio systems:

#### BASS:

AudioQuest's patented GND (Ground-Noise Dissipation/phase-cancelling array) technology is extraordinarily effective, but its benefits come at a price. Though a BASS cable will demonstrate a very high bandwidth when measured with a single tone at a high signal level, it can lose some low-level content at extraordinarily low signal levels above 10kHz. It is therefore never suitable for full-range applications. It is, however, the cable of choice for multi-amplified speaker systems that direct signals to any driver other than the tweeter or super-tweeter. A speaker system that directs signal to a tweeter or super tweeter is best served with a ZERO cable.

#### ZERO:

AudioQuest's ZERO (no characteristic impedance) technology offers extended frequency bandwidth, extraordinarily linear noise-dissipation, and the lowest transient current compression possible in a speaker cable. However, it is important to note that with this strength, comes vulnerability. If two or more ZERO cables are paralleled (such as when bi-wiring), the two cable circuits could create a very high-frequency resonant peak (ringing), making that combination unsuitable. This cannot occur with a single ZERO cable in any connection scenario, nor can it occur when a ZERO cable is used in a BiWire COMBO with a BASS cable. In either of those configurations, the issue is completely nullified.

### Improved Amplifier Performance

Additionally, though a well-constructed power amplifier may have a solid aluminum or steel chassis with extraordinarily low impedance at 50-60Hz, the impedance is going to be considerably higher at radio frequencies. This chassis is depended on to drain away these induced radio-frequency noises.

Since any current (induced RF noise included), will take the path of least resistance, AudioQuest's GND Technology can help lower the transient intermodulation distortion. It does so by capacitively coupling and low-impedance draining much of the RF noise to the BASS model cable, where it is then turned into heat or drained in the direction of far less sonic harm or negative consequences. This is toward the speaker, significantly improving the performance of the amplifier.