



# Understanding BiWiring

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## Understanding BiWiring

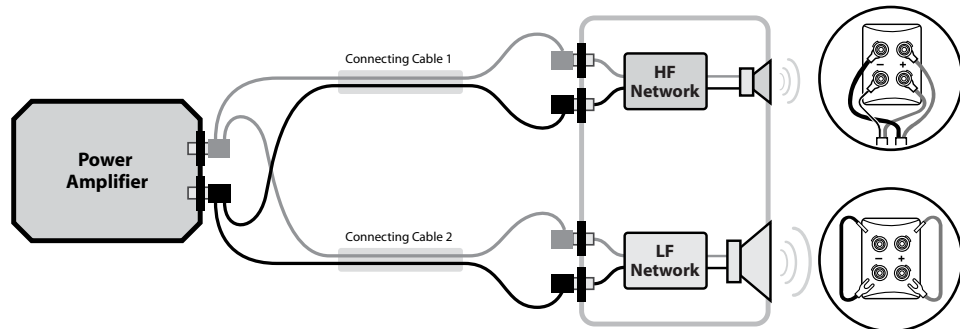
Many of today's speakers can be "BiWired", meaning the speaker has separate inputs for the woofer and separate inputs for the higher frequencies. Should you BiWire? If so, should you BiWire with a single cable (Single BiWire/SBW) or with two separate cables (Double BiWire/DBW)?

Is BiWiring so important that you should spend twice as much on speaker cable? BiWiring is actually a way to get higher performance for the same expenditure. The BiWiring question is not about how much money to spend, but how to maximize performance and value.

### Magnetic Fields and Bass Energy:

When using a single full-range speaker cable (not BiWiring) the large amounts of bass energy carried within the single cable has an adverse effect on the upper frequencies. In a BiWire set-up the cable feeding the higher frequencies no longer handles the large magnetic fields caused by the high current needed to produce bass. BiWiring does not affect the bass fundamentals, but the treble signal now travels a less disturbed path. It's a little like the difference between swimming through waves versus through smooth water. Bass frequencies will sound better because bass definition is actually located in the midrange and higher frequencies. *It is always worthwhile to take advantage of the benefits of BiWiring when the speaker manufacturer has gone to the extra expense of providing this capability. The performance benefits of reducing distortion in this way are substantial.*

### BiWiring and Cable Geometry:



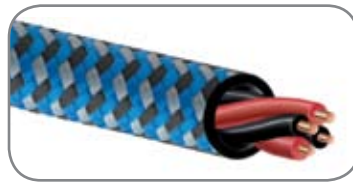
When BiWiring, the two (bass and treble) cables must either be identical, or have essentially identical geometries. If the cables have different geometries they will have different capacitance and inductance. Capacitance and inductance are the values used to create a loudspeaker's low-pass and high-pass filter networks, together making a crossover. Having different values in the two cables effectively redesigns the crossover...not a good thing! The integrity and coherence of the speaker will be compromised.



For best performance, use two of the same cables. If the speaker has a low crossover point (a 3-way speaker or a panel-hybrid such as Martin Logan) much of the benefit of using two identical cables can be realized by using two cables which have the same geometry, but which use different qualities of metal.



CV-4



TYPE-4

In the example above CV-4 (with its superior Perfect-Surface Copper) for the upper frequencies is paired with Type-4 (which uses Long-Grain Copper) to drive the bass. Why do this? It's less expensive!

This “trick” does not work for 2-way speakers. They have their BiWire access frequency in or above the midrange ... music and voice and practically everything else is in the midrange and must be given full respect. When Bi-Wiring with 2-way speakers always use two identical cables.

### BiWiring Within a Single Cable:

Another valid BiWire option (with proper cable design) involves the use of a single speaker cable divided into separate “high” and “low” frequency sections. We call this Single BiWire (SBW). This works better with some cables than with others – *but BiWiring using two separate cables is always better*. We do not recommend Single BiWire when using a Star-Quad model (Type-2, Type-4, CV-4). *More importantly, please understand that, except for the Rocket and Flat-Rock Series, it is better to use two less expensive cables than to Single BiWire with one better cable*. Using two pairs of CV-8 is better than a Single BiWired Mont Blanc, for example.

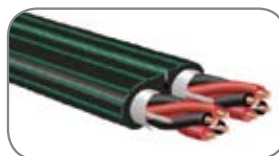
### The Rocket Series



Rocket 33



Rocket 44



Rocket 88

Rockets are excellent for Single BiWiring *because they are essentially two cables in a single outer jacket*. While great for use as full-range cables,

these models, when used as Single BiWire cables, actually become a specialized true Double BiWire thanks to their two separate Star-Quad components. The two groups of conductors have a degree of magnetic autonomy found in no other single cable.

### The Flat Rock Series



Rockefeller

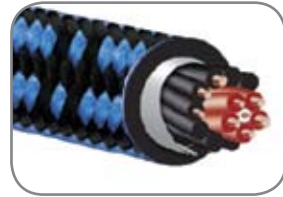


Gibraltar



K2

While the Rocket Series and Flat-Rock Series are excellent for Single BiWiring, the Earth-Feature Series (Monte Blanc and Volcano), are poor choices for SBW. One of the significant advantages of the Earth Feature cables is the unusually effective way they manage the relationships between magnetic fields. The conductors spiral in opposite directions, but the positive and negative groups form two tubes whose relationship is constant and non-changing. Dividing the conductors in these models does very little to separate the magnetic fields of the bass and treble groups.



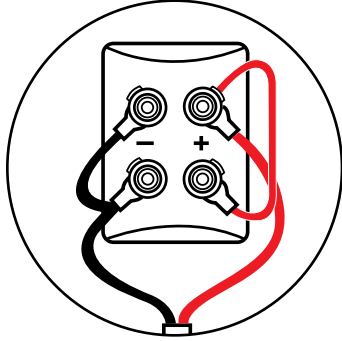
*The Earth-Feature Series is best when used full range – with speakers having a single set of connectors – or when two are used per speaker in a Double BiWire set up.*

That leaves the 8-Series in which, for instance, Single BiWiring with CV-8 is effective, though only half as effective as running a Double-BiWire of CV-4.

You can Double BiWire by stacking connectors at the amp, or by simply ordering Double BiWire cables. AudioQuest simply joins the two cables together at the amp end before attaching the terminations. The price for a double BiWire pair is simply the same as adding together the price of the two cables, whether the same model or different models.



## Using Full Range Cables On BiWire Capable Speakers:



When using a single set of full range cables with a BiWirable speaker, you might as well do it properly ... it costs nothing and makes a difference you can hear. When using jumpers (factory supplied or replacements), be sure to put both red and black connectors to the treble input of a 3-way or panel-hybrid . Bass is less sensitive to having the jumpers in the signal path.

For *2-way speakers*, be sure to put the red connector to treble + and black connector to bass -. This is the only way to preserve the tonal voice the speaker designer intended.

If you do not BiWire, at the very least, connect a single set of speaker cables as recommended above. Ideally, you should use a set of AQ PSC Jumpers to make the BiWire jumper connections at the speaker. What about those “free” shiny metal jumpers that came with the speaker? It’s entirely accurate to describe these as “worth every penny you paid for them.” Simply put, these are very poor sounding devices.

Questions? Don’t hesitate to call or e-mail....we are here to help!

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This paper was authored by AudioQuest's Vice President of Product Development, Joe Harley and Northeast Regional Sales Manager, Keith Dowd.

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