
Subject: Will Longer Wires Reduce Sound Quality?
Posted by [Jorel](#) on Wed, 19 Jan 2011 01:41:28 GMT

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I visited my father this weekend and noticed that the wires for his speakers that are connected to the TV is lengthy. I don't know if it is my ears or not but the sound is much better when I disconnect the extra speakers and only use the built-in speaker of the TV.

Subject: Re: Will Longer Wires Reduce Sound Quality?
Posted by [Adverser](#) on Wed, 19 Jan 2011 04:50:51 GMT

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Jorel wrote on Tue, 18 January 2011 19:41 I visited my father this weekend and noticed that the wires for his speakers that are connected to the TV is lengthy. I don't know if it is my ears or not but the sound is much better when I disconnect the extra speakers and only use the built-in speaker of the TV.

In a word: no. It takes a whole lot of heavy wire at ridiculous lengths to have even a negligible effect.

That said, I still measure wire at 3 feet pretty precisely at 16 gauge.

Falls well within the tolerance unless you are talking hundreds of feet if not thousands of meters.

Subject: Re: Will Longer Wires Reduce Sound Quality?
Posted by [Jorel](#) on Fri, 21 Jan 2011 12:29:53 GMT

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If this is the case then I would assume that the speaker itself has the problem. I just visited the doctor about my ear because I can't hear soft voices any longer.

Subject: Re: Will Longer Wires Reduce Sound Quality?
Posted by [Tess](#) on Mon, 14 Mar 2011 11:23:23 GMT

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My boyfriend always says that the length of cables reduces the quality of whatever the cables are connected to - including the TV and computer as well as speakers. I hope that Adverser's comment : " It takes a whole lot of heavy wire at ridiculous lengths to have even a negligible effect." applies to all such cables - then I can move some furniture ! Everything sound/vision/computer related has to be grouped around sockets to satisfy the old fella.

Subject: Re: Will Longer Wires Reduce Sound Quality?

Posted by [Adveser](#) on Mon, 14 Mar 2011 17:40:27 GMT

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Trust me, unless you are wiring sound across a big warehouse or something like it will not degrade the quality at all.

People say "quality" when they mean impedance (total resistance to current) in wires. I have read that this problem was solved long ago anyway.

I think the confusion lies in people's assumptions about components. They see a resistor that is the size of an ant that has a large number attached and assume that 20 lbs. of copper is going to be somewhere in the ballpark. I know I would if I didn't know better. But that just isn't the way it works.

The only problem I have ever heard is when an audio engineer needs a very low-impedance cable and they need 250 feet of it...tall order, but can be fixed with a "buffer" that adjusts the impedance.

There is no such thing as quality loss or a better quality cable with digital. It works or it doesn't, unless you are talking about making your own Fiber Optics cables, which if you were, you'd know what the deal is on the loss of propagated light. Don't worry about that though, that's a bit much for the discussion.

Subject: Re: Will Longer Wires Reduce Sound Quality?

Posted by [Bill Epstein](#) on Wed, 16 Mar 2011 00:14:08 GMT

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Sorry, but cable length issues are caused by capacitance, not impedance, and increasing capacitance over very short distances, 20, sometimes 10 and even 3 feet, will cause the cable to act as a filter. As in filters out the music.

Subject: Re: Will Longer Wires Reduce Sound Quality?

Posted by [Adveser](#) on Wed, 16 Mar 2011 02:47:36 GMT

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I am going to disagree with that and point to this section of the wikipedia article on speaker wire:

Quote:Speaker wire capacitance and inductance normally have no effect on audio quality, though extreme examples using unusually low-impedance speakers and exceptionally long wire runs can show a small effect.

http://en.wikipedia.org/wiki/Speaker_wire

For the record, we all know Wiki is an awful non-academic source, but it had the info I needed.

Included in the article is the chart of recommended lengths vs. gauge.

Maximum wire lengths for two conductor copper wire[3]

22 AWG (0.326 mm ²)	3 ft (0.9 m)	6 ft (1.8 m)	9 ft (2.7 m)	12 ft (3.6 m)
20 AWG (0.518 mm ²)	5 ft (1.5 m)	10 ft (3 m)	15 ft (4.5 m)	20 ft (6 m)
18 AWG (0.823 mm ²)	8 ft (2.4 m)	16 ft (4.9 m)	24 ft (7.3 m)	32 ft (9.7 m)
16 AWG (1.31 mm ²)	12 ft (3.6 m)	24 ft (7.3 m)	36 ft (11 m)	48 ft (15 m)
14 AWG (2.08 mm ²)	20 ft (6.1 m)	40 ft (12 m)	60 ft (18 m)*	80 ft (24 m)*
12 AWG (3.31 mm ²)	30 ft (9.1 m)	60 ft (18 m)*	90 ft (27 m)*	120 ft (36 m)*
10 AWG (5.26 mm ²)	50 ft (15 m)	100 ft (30 m)*	150 ft (46 m)*	200 ft (61 m)*

* While in theory heavier wire can have longer runs, recommended household audio lengths should not exceed 50 feet (15 m).

Subject: Re: Will Longer Wires Reduce Sound Quality?
Posted by [Bill Epstein](#) on Wed, 16 Mar 2011 19:27:12 GMT
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This could be endlessly debated so I'll just leave it with the most extreme case, that of a Moving Magnet phono cartridge cable and this quote from KT88, an EE and well-known component builder, on the Steve Hoffman Forum

KT8805-02-2010, 03:40 PM

OK Bill, you've opened the door, now give us more of your expertise! I know a bit about MC resistance loading, but not MM capacitance loading.

Does adding capacitance make the sound brighter or duller? If you were to make your tonearm cable longer, or add an extension to it, is that adding or subtracting capacitance? If one were to buy capacitors to tune the sound, what kind/spec capacitor should one be looking for for phono use?

Your knowledge is always appreciated.

Thanks, Stephen. It is rather complex. Doug has it right for microphone cable but not for phono cartridges. Oddly, it behaves in the reverse way with reducing capacitance in a MM phono cable or circuit reducing brightness. Inversely, adding capacitance makes things brighter. The reasoning is as Metralla suggests, a resonant peak in which the output of a MM phono cartridge has a steep HF rise. MC cartridges can also behave this way but require different loading and it can be mostly, so you'll see most advice to just ignore it as being insignificant and that the cartridges are not really sensitive to capacitive loading. I have even given this advice and for most people, it is accurate in terms of practice. In theory or in cases of very sensitive equipment, it can make a difference. I am not sure where the addition of capacitance resulting in increased brightness rolls off or even reverses (once overcoming the resonance to basically conform again to the standard as Doug indicated), but generally a phono stage adds 100pf to 300pf of capacitance in parallel to the cartridge input to try and keep the response flat. The problem is that most all cartridges are a little bit unique and one shoe doesn't fit all. So in practice, for a Mm cart, all you really need to know is that less capacitance results in a warmer or duller sound, while more capacitance results in a brighter or more clear, open sound.

So getting to your question about cable, interconnect cable has capacitance in itself. It is measured per foot and this is standard for all cable, of all types, all brands. So by reducing the length of the cable, you are reducing capacitance. In a MM phono connection from turntable to phono preamp, you are increasing brightness by increasing length. In a microphone cable, guitar or other instrument cable, or XLR cable, you are decreasing brightness by increasing length. So the MM phono connection is unique and has caused some confusion over the years. It doesn't matter if you make the cable yourself or it comes dangling from the table, all cable behaves this way.

One thing that every type of signal shares when it comes to cable length is signal loss. Irrespective of capacitance, there will be signal loss with additional cable length. With most signals, you can look at it as a pretty typical effect of losing HF first as the length increases and then distortion and noise throughout the band. There can be RF (ultrasonic) and ground plane artifacts (60, 120hz hum and buzz) added also. So not only do you risk losing signal, but adding noise. In a nutshell, longer cable results in lower SNR. Now that is just the electrical theory of it, again, in practice the opposite can occur. You can have situations where a shorter cable simply does not perform as well as a different type of cable of a greater length. Now that I've gone over all of that, let's remember that MM phono is unique and that it does not behave just like all of the other other signals when it comes to HF transmission. So, that case gets a little weird in that increasing length still causes signal loss like in all other cases, and it can also be subject to external noise interference by RF and ground issues, but it will also get brighter as the length is increased. So you'll end up with more noise and a brighter sound with peaks around 10kHz or so. That is why a lot of people obsess over phono cable. Most of the better phono cables and turntables equipped with cable take this into account however and use well shielded, low capacitance cable. So while it's interesting to talk about, it is generally not an issue unless you have a difficult match.

A difficult match is what I would describe as two items that behave in a way that accentuates the effect. For instance, connecting a known brighter sounding cartridge via a longer cable to a phono stage with a fairly high capacitance loading (250pf +), can result in a brighter than neutral sound and in some systems, it can be very bright. Of course, the opposite situation can also be found where a system can be assembled that sounds overly dark.

-Bill

Subject: Re: Will Longer Wires Reduce Sound Quality?
Posted by [Adveser](#) on Wed, 16 Mar 2011 20:56:36 GMT
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So basically you are saying a weak transducer signal is subject to audible effects and line level signals are not?

That would make perfect sense if so and would explain why guitar and microphone cables are picky about wire length and require buffering in long cables.

Subject: Re: Will Longer Wires Reduce Sound Quality?
Posted by [Wayne Parham](#) on Thu, 17 Mar 2011 14:41:45 GMT
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With speaker wires, it really is just a matter of resistance. That's not always trivial, though. I think in most cases it can be disregarded but if you have to run a long wire, it would be better to use larger wire. I would not want resistance to rise above about 25% of the load impedance. It's not just a matter of reduced signal, but also about the change of effective Qes, which shifts the woofer alignment. If the shift is large enough, it can make a speaker sound a little bit tubby.

The situation with (preamp level) signal cables is different because the circuit impedance is different. As Bill said, internal capacitance can be significant. The phono stage actually requires a pretty specific amount of shunt capacitance, too little and the pickup coil peaks, too much and

to create a filter in the audio band. A 220pF capacitor will rolloff the top octave, for example, starting around 15kHz. By the time you reach 470pF, the rolloff begins at 6800Hz. So you'll definitely hear the highs go away if you use a cable that has 470pF internal shunt capacitance. Say 25 feet of cable that has internal capacitance of 20pF/foot, for example.