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BRYSTON
A Lifetime of Music

This Issue

Please… I just want to get connected.

As you may know, Bryston manufactures RCA and Balanced XLR audio interconnect cables. I constantly get inquires from customers asking: why bother, given all these esoteric sophisticated cables being produced by specialty cable companies?

Believe me, we did not start out with a desire to be in the cable business. The impetus was a result of designing cable systems for the many Professional Recording Studios Bryston installs equipment in. At the studio level the interconnect cables and speaker wires must be extremely high quality but have to be reasonably priced and have proven engineering performance parameters. As a result the cables Bryston developed were simple straight forward cost effect designs based on proven engineering principles. As our consumer customers started calling regarding cable recommendations we decided to offer them the same RCA and Balanced XLR cables we were manufacturing for the professional market.

If you remember nothing else from this newsletter please remember this – the frequency response of the cable will be affected by the impedance it interfaces with. In other words, in the case of audio interconnects it is a HIGH IMPEDANCE connection (as opposed to a speaker connection which is a low impedance connection) and the cable characteristics are a function of this high impedance interface.

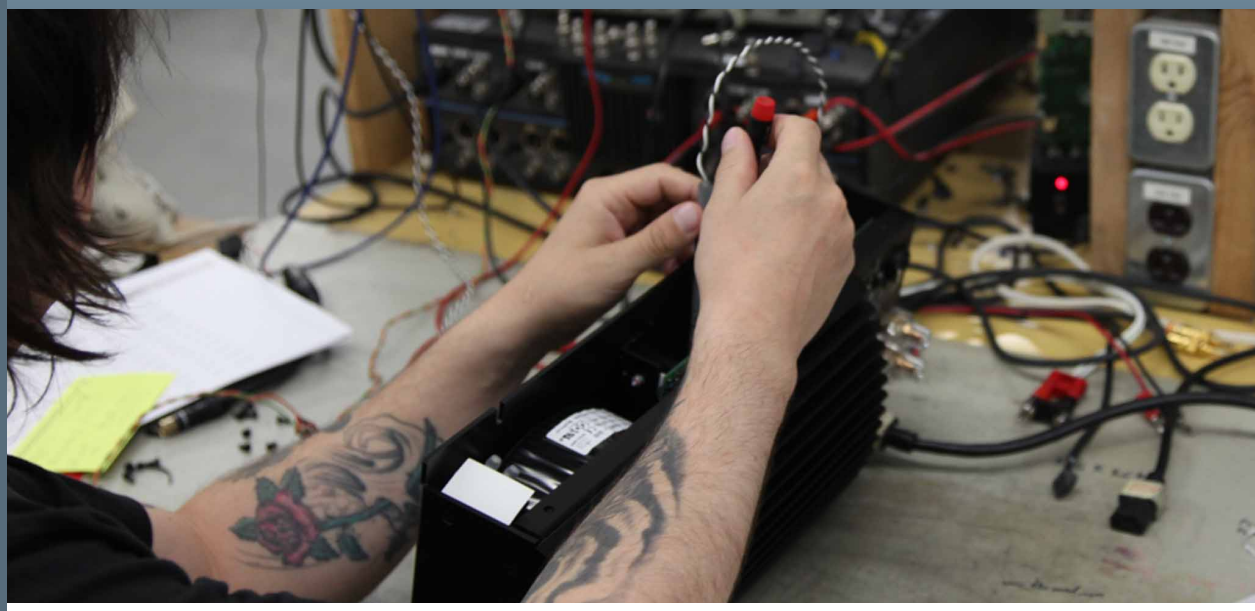
There are a differing variety of issues to be aware of when utilizing video cables, digital cables and of course loudspeaker cables in your system. I plan to discuss these in future newsletters, but for now let's just concentrate on the good old analog audio coax interconnect.

1. Transport an analog signal voltage from a source to a load without changing the signals amplitude or shape.

2. Protect the signal from hum, noise and any other forms of electromagnetic interference.

3. Make long-lasting secure connections.

When you're dealing with interconnect cables the three major performance issues are Resistance (R), Inductance (L) and Capacitance (C). Because the interface, in the case of an analog audio interconnect is a 'high impedance' connection, any issue with resistance and inductance is a moot point with high quality



cables (especially at the distances typically used in audio systems). What is very important is the parallel capacitance.

Capacitance, unlike resistance and inductance, can cause serious negative consequences in an audio system. The real culprit in this case is the sources' output impedance. The cable capacitance is charged and discharged by the signal through the output impedance of the source – usually a preamplifier. Any waveform smearing occurs at a rate that is determined by the mathematical product of output impedance (Z) and parallel capacitance (C) and is independent of signal frequency and amplitude.

This characteristic makes the cable behave like a low-pass filter so the output impedance and input load impedance is very important when connecting your equipment.

This is why it is critical when using tube equipment (which generally has high output impedance) to keep interconnects as short as possible. It is also why using passive volume controls can be a serious problem because the passive control will actually change the frequency response of your system as a function of its position of rotation. So at the 9 o'clock position you have one frequency response and at the 12 o'clock position you have another frequency response. The reason this is happening is because the passive control is changing its output impedance with position and therefore its frequency response. No wonder people sometimes report hearing major differences in cables when using these types of systems.

So the major point here is that cables always have to be viewed as an integral part of a circuit and recognize that what you are hearing from cable to cable is in actuality a frequency response shift as a result of the interaction of the cable with the specific source and the specific load. You are never listening to just the cable.

It is generally agreed, with analog interconnects, that your source impedance should be at least 10 times to 50 times smaller than your load impedance if flat frequency response is the goal. The output impedance of the Bryston BP 25 preamplifier is less than 100 ohms. The input impedance of Bryston amplifiers is typically between 20K and 50K Ohms.

Brystons RCA and XLR Balanced Interconnect Cables are designed and manufactured with the above engineering principles in mind.

If you want a much more detailed explanation of all the issues discussed above have a look at Jim Hayward's superb article in Andrew Marshall's Audio Ideas Guide Magazine (Summer/Fall 1994).

Another question which I continually get asked is – "do after-market specialty power cords sound better with Bryston power amplifiers?"

There is likely to be 50 miles of cable and half a dozen or more transformers between you and the power plant generating the power that your sound system uses. It is unlikely, to say the least, that a power cord occupying the final six feet of that 50 miles can do anything positive to change the conditions of that power.

In fact, it is possible to do damage to power delivery, by restricting current flow. For instance, that would be

the case if you had a power cord that was too thin for the power requirements of your amplifier. If on the other hand the power cord was much larger than necessary it would unfortunately be limited by outside factors, such as the size of the wiring in your walls, or outside your house.

It is also possible for a power cord to incorporate bandwidth-limiting components, to restrict the influx of RF or other contaminants to the 60 Hz waveform. It is not possible, unfortunately, to do this without restricting the flow of 60 Hz current to some degree as well. Most audio products, especially including Bryston audio components, contain internal circuitry designed to eliminate these contaminants within the power supply. They are designed to operate from an unrestricted source of 60 Hz current, and will actually work less well if the current is restricted from the outside.

In sum, it is certainly possible for a six-foot power cord to have an effect on the sound. It is not possible, unfortunately, for this change to be an improvement, at least in connection with Bryston products.

Bryston recommends that our customers do careful listening prior to spending what is usually a very substantial amount of money on exotic power cords.

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