Sunny Cable 600 Series

"Time Accurate" Home Theatre Cables

Danny Richelieu

Introduction

While Sunny Cable Technology is definitely not a household name at this juncture in their history, you may still be familiar with them if you have followed our trade show reports over the past couple of years. My first introduction to Sunny Cable actually came in the mail a year and a half ago, when sample loudspeaker cables were sent to our main offices. Piquing my interest, I installed the cables in my reference theatre to give them a demo, and was thoroughly impressed.

A couple months later, at the 2005 International CES, Editor Gary and I were making our rounds when we stopped by the Sunny Cable Technologies suite at the Alexis Park Hotel (see "CES Report 2005: Part I," Issue 95, April 2005). We were so impressed with the demos given, we asked for more cables to be installed in my reference home theatre. I was given a complete set of their original 600 series cables to test in my room. The level of detail and realism they imparted on my system was striking, and these Sunny Cable 600 series cables quickly became my reference.

As time moved on, I was still just as impressed with the cables as I was that first day of listening, and we decided it was time for a full review. Andre Au and Sunny Lo decided it would be best to review a combination of their updated 600 and 1000 series cables, the latter of which, according to their Web site, "give the most performance per dollar value." Andre and Sunny also suggested we perform the review in our Reference Holosonic™ Spherical Surround™ Home Theatre Laboratory and provided a complete set of cables for our system, including: eight SP600 loudspeaker cables, one D5000R coaxial digital audio cable, eight S600X balanced analog signal cables, and seven P1000 power cables. These too are now permanent fixtures in our largest reference theatre.

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The Technology

Obviously, what makes Sunny Cable's product so good is the technology. Each cable uses Sunny Lo's patent-pending design to reduce the time-distortion that occurs in all cables. The key term here is reduce, as it is a physical impossibility to completely eliminate these distortions from a cable.

The typical cable consists of a grouping of insulated conductors and plugs. It seems simple, right? Well, usually it is just that simple. Sunny wasn't satisfied with the sound produced by simple cables—and, yes, I do mean produced. Most cables impart their own sonic signature on an audio signal, when a cable's only job is to accurately transmit the signal without changing the sonic character. The best loudspeaker cables are those that do nothing but transmit signals.

The key to Sunny Cable Technology's cables is the conductor core, which uses a "revolutionary structure" designed to reduce self and mutual inductance, which Sunny believes is the "most harmful side effect caused by signals traveling through a conductor." But that is not the only thing Sunny cables combat, which I will get to later.

As Andre and Sunny will agree, Sunny Cable Technology's products will not be winning many beauty contests and will probably not be well-accepted by the non-audiophile portion of your household, but their beauty really is on the inside. The cables are large, with signal and loudspeaker cables a rotund one-inch in diameter and the corpulent power cables really filling their sleeves at two inches in diameter. The type of material and diameter of the actual conductors in each cable depends on the application.

That isn't to say these cables are ugly, though. They are available in both pearlescent white (made of Teflon, which is flame, chemical, and extreme temperature resistant) or conductive black sleeves [which offer an extra layer of shielding against EMI (electromagnetic interference) and RFI (radio frequency interference)]. Sunny Cable suggests using the conductive black

sleeves for video and home theatre applications, as well as in heavily populated areas where external EMI and RFI are more prevalent. For this review, Sunny Cable supplied all the cables with the conductive black sleeves, which blend into the black carpet in our reference theatre very nicely.

After painstakingly testing numerous connectors by hand, Sunny chose the highest quality RCA and XLR connectors he could find, and then added the thickest silver-plating he could find. Loudspeaker cables use their own 99.99-percent pure silver spade lugs or two-millimeter bare wire ends. Our samples came with the bare wire option. Sunny Cable's power cable ends use industrial grade pure brass plugs and IEC connectors.

"Time Accurate"

As most people have come to realize, physics is not easy. Not only is it difficult to learn and understand, but it is impossible to get around its intrinsic laws in the real world. What makes this worse is that many of the laws of physics can do real damage to an electric signal as it passes through any conductor, including cables. While some of these physical phenomena will not drastically affect the signal passing through these cables, there are some that can do serious harm.

Since 1997, Sunny Lo has been researching and picking out the most harmful of these phenomena and has developed his patent-pending design to minimize them all. According to Sunny, the most problematic of these natural effects toward affecting the accuracy of a cable are: multiple-conductor pathway errors, self-inductance, mutual inductance, the storing and releasing of energy in capacitors, vibration, and external electromagnetic interference (EMI).

The common denominator between all of these? They all affect the time alignment of the voltage and current in the signal. So when Sunny calls his cables "Time Accurate," he is referring to the technologies employed that help minimize the time alignment errors that are caused by these physical phenomena.

Multiple-Conductor Pathway Errors

Because most cables used for audio transmission are comprised of a large bundle of conducting wires, the signal has nearly unlimited pathways (as each time a wire touches another wire, it creates a new pathway) to move through the cable, choosing that path with the least resistance. Because of this, the likelihood of a signal transversing through this conductor with the proper time alignment is decreased.

To combat this, Sunny Cable uses one solid-core conductor for each pole of the cable (two-poles: "positive" and "negative" in the case of loudspeaker and RCA signal cables; three-poles: ground, in-phase or "hot," and out-of-phase or "cold" in the case of balanced XLR cables). This essentially gives the signal in each pole one path for transmission.

Mutual And Self-Inductance

Mutual and self-inductance are probably the two biggest problems facing a signal as it is transmitted through a cable. Understanding mutual and self-inductances requires some fairly serious physics, but I will attempt to make it as clear for you as I possibly can.

First, you need to know a couple of laws of physics—Faraday's and Lenz's laws, in fact. Faraday's law, in a nutshell, says that the induced emf (induced electromotive force, or in other words, an outside influence that will create an electrical current flow) is caused by changing magnetic fields. Lenz's law says that the direction of the induced current caused by the induced emf will always oppose the cause of the changing magnetic field (the original current). When you realize that currents passing through a conductor create a magnetic field, you can start to see the problem.

While constant magnetic fields created by this current will not do any harm to the current, as the current changes, the magnetic field changes. Unfortunately, changing magnetic fields will do harm to the current. By Faraday's law, the changing magnetic fields create another current inside the cable, which opposes the change of the current originally being transmitted through the cable (according to Lenz's law). This is what is known as self-inductance, which, essentially, makes it more difficult for current to change, which, essentially, decreases the accuracy of the signal passing through the cable.

The problem with magnetic fields is that they propagate out of the conductor into anything surrounding it, including other conductors. And guess what? Once that changing magnetic field hits another conductor, it induces an emf in that conductor, which induces a current. This is mutual inductance. So, as a current passes through a

Editor-In-Chief Gary Reber Comments:

Danny has done an excellent job at the technical explanation for the superb performance of the line of cables developed by Sunny Cable. We have had a lot of experience with cables over the years from various manufacturers who make excellent cables. In fact, we use cables from several manufacturers in our various reference systems at *Widescreen Review*. Sunny Cable has pulled back yet another curtain to reveal a level of transparency that I have not experienced before, both in terms of sound and picture clarity. I have always been an advocate for time-correct loudspeaker designs such as the Dunlavy Signature Series, Thiel, Lepinski Sound, and Vandersteen. When combined with Sunny Cable's "time accurate" interconnect and loudspeaker cable, the result is performance of the highest caliber, which can be appreciated in the refined detail, richness, and naturalness these cables impart on good recordings. Their power cables are remarkable for their ability to significantly improve overall picture quality with less noise. I highly recommend you audition these cables in your system. ■

cable, it not only is affected by the magnetic field created by itself, but it is also affected by the magnetic fields created by every other current near it.

In other words, the changing magnetic fields, and more specifically their induced currents, do a world of hurt on the signal you are trying to transmit through a cable. Because of these induced currents, the fine detail in a signal being transmitted through a cable can be seriously damaging to the timing of the audio, messing with the subtle rhythms that get your toe tapping. It can also be heard as a muddling of the fine details in a signal, which are so important when trying to bring the recorded audio back to life.

To make things worse, the effects of mutual and self-inductance can cause what is known as group delay, where different frequency "groups" are delayed longer than others. This "time smear" of frequency groups across the audible frequency spectrum also takes away from the realism of a recording.

Mutual and self-inductances are dependent on the size and shape of the conductor, the magnetic properties of the conductor, and—in the case of mutual inductance—the distance between the two conductors. So, it is possible to minimize these effects. What makes a cable great is its effectiveness in combating them.

What does Sunny Cable do to combat mutual and self-inductance? Unfortunately, that's where the "pending" portion of "patent pending design" gets in the way. Without being privy to the exact details, I am forced to accept that they have done something to combat these induced currents and have done some actual listening for proof.

Cables As Capacitors

A capacitor is created whenever two conductors are separated by an insulator, also known as a dielectric. A capacitor is used to store electric charge and can also be used to smooth out fast variations in voltage. While this can be useful in many situations, in the transmission of audio through a cable, it can be very bad.

Because of the nature of capacitance, it can be most damaging in interconnect cables (where signals are high-voltage, low-current). Capacitors will charge (store energy) until the point when the voltage in the signal and the voltage in the capacitor are equal. When the signal's voltage changes, the capacitor will charge or discharge to match that voltage, which will create a changing current, which will create a changing magnetic field, which will create self and mutual inductance, and we know that we don't want that. So, the capacitance of a cable needs to be held to a minimum if you want an accurate cable, exactly what Sunny Cable claims to do.

Vibration

Like that lamp in your home theatre that starts humming every time a certain frequency is played back through your system, cables can be affected by mechanical resonance. As current passes through a conductor, it will vibrate, which in turn will cause fluctuations in the magnetic fields of the conductor. These changing magnetic fields will create induced currents...are you beginning to get the point?

So, combating mechanical vibrations and resonances is another key component to the design of an accurate cable.

External Interference

All the cables employ extensive shielding to external interference, which consists of multiple layers of different materials all connected together with an external ground wire at the front end of each cable. When external interference (EMI, RFI, etc.) hits the shielding layers, it is converted into electricity and stays on the surface of the shields. Sunny Cable includes the external ground wire at the front-end of the cable to drain this unwanted electricity away immediately after conversion, so as to minimize the chance of external interference going into the conductor core.

Listening Tests

Now that that is out of the way, on to the real fun.

As I said earlier, the end result of correcting for all the physical phenomena that can decrease a cable's accuracy should be increased detail and better rhythmic timing. Throughout my listening tests, I found Sunny Cable Technology's 600 series cables to do just that, as subtle details were better defined and the entire presentation felt and sounded, well, real. I caught myself tapping my toe with more regularity using the Sunny cables, which is always a great sign.

Listening to the well-recorded vocals in the SA-CD release of Ladysmith Black Mambazo's *Long Walk To Freedom*, the benefits of the Sunny Cable Technology 600 series were audibly apparent, as the subtle smack of lips and the delicate cracking in the throats of the singers could be heard around the room. With the lights turned off, it felt like the entire troupe was surrounding my seat singing directly to me. The atmospheric effects that were purposely mixed into the recording were much more realistic, turning our listening room into a large amphitheatre with resonating echoes that seemed to come from well beyond the physical location of the loudspeakers.

The Sunny cables also helped better define the soundstage, as each voice in the recording was given a well-placed location in the room. The cables also helped build dimension, helping break down the stereo walls to create stereo fields.

If there is anything that is slightly lacking in these cables, it might be the overall extension they allow. It could be my imagination, but the cymbals in the SA-CD release of Diana Krall's *The Look Of Love* seemed to be slightly restrained on the extreme high end, which resulted in them not sounding 100-percent realistic. While it can definitely be argued that I am nitpicking here, it's something I heard, or didn't hear, so I have to report it.

The difficulty in determining group delay characteristics of cables comes from the relatively long times needed for them to be noticeable. In cables that do not attempt to correct for the natural causes of group delay, it is readily apparent. In cables that do a good job at minimizing the causes,

there can still be group delay errors that you cannot immediately pick up on. This will cause the music to lose that effect that gets your toes tapping with the beat. The best cables will keep your toe tapping by making sure all the frequencies being transmitted through the cable arrive at the same time, which is where Sunny Lo got the term "time accurate."

The timing accuracy of Sunny Cable Technology's 600 series cables could especially be heard in the bass. In Ben Harper's *Burn To Shine*, the kick drum provided more immediacy, resulting in a more realistic, live sound. It was impossible for me to stop myself from nodding my head and tapping my toes along to the beat of that kick drum. While this album is recorded very well, the mix is not very creative, with the stereo stage generally limited to three distinct points in space and not much phantom imaging between the center image and discrete channels. The 600 series cables helped accentuate this fault by clearly separating the stage. While some may argue this is a downside of great equipment...wait, who would argue that? The Sunny cables helped me re-create the exact soundfield the mixer heard when creating this album, which is exactly what you want from your equipment.

The subtle increases in detail can be difficult to hear when listening to compressed audio sources, such as DVDs with Dolby® and DTS® encodings. The timing can be heard, though, as the bass elements of effects in *Kill Bill Vol. 1* often showcase. While the recording quality is quite good, the lossy codecs take away most of the extreme detail that is delivered using these cables. Lets just say, I am really looking forward to the linear PCM and lossless soundtracks that will be available with the upcoming next-generation optical disc formats.

One thing that was easy to pick out was the impact and articulation of the bass in this soundtrack. The Sunny Cable 600 series did a first-rate job of delivering the deep bass with accuracy and speed. It really added life to the soundtrack.

Conclusions

The best thing the Sunny Cable Technology 600 series cables do is nothing. Nothing is added to the signal that would color the characteristics of the audio as it passes from the player to the preamp, from the preamp to the amplifier, and from the amplifier to the loudspeaker. From the tests I have available, it was clear to me that Sunny Cable Technology actually put the third word in their name to use, as the cables seemed to minimize group delay and maximize fine detail to the best of their ability, making them a perfect fit as the cable of choice in our reference home theatre. For anyone trying to get everything they can out of their home theatre system, they should definitely audition Sunny Cable Technology's products. At this point, I just can't wait to listen to the 1000 and Supreme series cables.