EQUIPMENT REPORT

Bel Canto mLink, uLink, and REF Link USB Converters

Three Compelling New Solutions for Computer Audio

Steven Stone

When I reviewed the Bel Canto DAC 3.5 VB in Issue 216 I found it to be an outstanding full-featured DAC/preamplifier that only lacked a USB interface. Bel Canto's thinking was that USB interface technologies were advancing so rapidly that any USB solution included in the DAC 3.5 VB would soon be eclipsed by the next generation of external USB interface devices. So Bel Canto offered an external 96/24 USB converter.

During the intervening time period, Bel Canto's thinking was proven correct—USB interfaces have continued to improve—and now that the technological dust has settled somewhat, Bel Canto has introduced three separate USB interface boxes. While they all share the same core design, the three boxes differ in interface options and power-supply implementations.

Bel Canto's least-expensive USB interface device is the $375 mLink, which has a USB input and a lone BNC-terminated S/PDIF output. Like all the Bel Canto USB converters, the mLink supports up to 192/24 PCM via USB 2.0. The $675 Bel Canto

uLink is also USB buss-powered and includes an AT&T ST-Type glass optical output as well as a BNC S/PDIF. The top-of-the-line $1495 REF Link is the only Bel Canto USB device that uses a dedicated low-noise external power supply and adds an AES/EBU output in addition to a BNC S/PDIF and ATT glass optical.

Both the mLink and uLink share the same size enclosures, and except for the differences in color (the mLink is black and the uLink is silver) and outputs, the two units appear identical. Since they both get their power from USB and weigh well under a pound, they are ideal for someone looking for a completely portable USB interface. The REF Link is substantially larger and has the same footprint as Bel Canto's other half-width components. The Ref Link also has a knob that lets you change the display from bit-rate to firmware version to off. Due to its size and integral AC power supply (the mLink and uLink are powered through the USB buss), the REF Link is the only Bel Canto USB box that is not readily portable.

Shared and Proprietary Technologies

After spending some time with the Bel Canto units I had some technical questions for John Stronzer, Bel Canto's designer. My first was how much technology was common to all three devices. According to John, "The 500MHz USB processing core daughter-card is shared on all three Links as well as the S/PDIF output circuitry. The mLink and uLink are very similar in sharing buss power and overall power-supply architecture. The real difference is in the quality of the clocks. The mLink uses Low-Phase-Noise clocks, while the uLink uses the new Ultra-Low-Phase-Noise clocks. The REFLink also uses Ultra-Low-Phase-Noise clocks and adds further isolation and low-noise internal power supplies, plus galvanic isolation between the USB processing core, the clock, and output electronics. No power is drawn from the USB buss."

The Bel Canto Web site has several technical papers and FAQs about the USB Links. The published graphs show exactly how low-noise Bel Canto's clocks can be. The three Bel Canto USB boxes also meet USB 3.0 specifications.

The Sonics Inside

The primary issue for these USB boxes (or any new component) is whether they deliver superior sonics compared to other similarly priced solutions. I found the answer depended as much on the DAC used with the Bel Canto uLink, mLink, and REF Link as on the devices.

I used the Bel Canto USB converter boxes in four different setups for this review. The first was based around the April Music Eximus DP-1 DAC/pre. Since it has two S/PDIF inputs I could hook up two different USB converter boxes and do rapid, real-time, matched-level A/B comparisons. The second setup utilized Bel Canto's DAC 3.5 VB, which also has provisions for two S/PDIF inputs (as well as AT&T glass optical). The third DAC/pre I used was the Wyred4Sound DAC 2 because it has an I²S HDMI digital input. This allowed me to use the Empirical Audio Off-Ramp 5's lowest-jitter output. Finally I tried a NAD C 390DD digital integrated amplifier to see how USB converters affected a direct-digital amplifier.

The first thing I wanted to do was compare the various Bel Canto USB boxes to each other, but that was not as easy as I'd hoped. Since they share the same driver, when you connect more than one Bel Canto USB converter to a Mac, the Mac defaults to the most recently plugged-in device. To A/B two Bel Canto boxes I had to unplug and then re-plug their USB cables, which took too much time for rapid comparisons.

During longer listening sessions using the new ProAc Tablette Signature monitors I felt that the REF Link consistently delivered the best sonic results, especially on 192k material using its AT&T optical connection. The REF Link's soundstage had an extra dollop of solidity and edge definition when compared to its siblings. I also felt the REF Link delivered a blacker, more silent background.

When I compared the uLink with the mLink S/PDIF outputs in matched-level listening tests through the Eximus DP-1, I was hard-pressed to hear much difference. But when I used the uLink's AT&T optical connection tethered to the DAC 3.5 VB, differences did emerge. The uLink's optical connection provided depth recreation and image specificity that almost equaled that of the REF Link. If you have a DAC with an AT&T optical input I'd recommend gravitating toward the uLink's AT&T glass connection. If your DAC only has S/PDIF, the mLink remains the most cost-effective high-performance option.

I compared the Bel Canto's least expensive box, the mLink, with the Musical Fidelity V-Link USB converter (which has been replaced by the V-Link II). While the V-Link still sounds quite good, the mLink was simply better in every way. The mLink had superior focus, a slightly larger soundstage, and a more lively dynamic presentation. In comparison the V-Link lacked a bit of life, giving it a less involving character.

Since I got my first copies of Pure Music and Amarra playback software for the Mac, one of my standard tests for new hardware has been to compare the sound of stock iTunes with the sound of Pure Music and Amarra. Through the Bel Canto USB links the improvements wrought by both Pure Music and Amarra were quite obvious. Regardless of which DAC/pre they were hooked up to, all the Bel Canto USB devices' sonics improved when using Pure Music or Amarra. Depth, image solidity, soundstage focus, and low-level detail were all better than stock iTunes.

I spent the majority of my listening time with the Bel Canto REFLink, comparing it to my current reference, the Empirical Audio Off-Ramp 5 with a Short-Block USB dongle. And as I discovered during the review, the "best" USB solution depended on which DAC the USB device was attached to and which digital interface methodology was used. For all my A/B tests I used identical 3-meter lengths of AudioQuest Carbon USB cable between my Mac Pro and the USB converters and identical lengths of Wireworld S/PDIF cable between the USB converters and the DAC.

For my first comparison I used the April Music Eximus DP-1 DAC/pre and connected the Empirical Audio and Bel Canto USB devices via S/PDIF. After several consecutive days of listening I was unable to discern any noticeable sonic differences between the two USB converters. Both delivered slightly more precise soundstaging and imaging than the DP-1's own USB interface, but I could not consistently distinguish one from the other in "blind" tests.

Next, I replaced the DP-1 with the Bel Canto DAC 3.5 VB. Once more I had two S/PDIF inputs for A/B comparisons, as well as Bel Canto's AT&T glass optical connection. Once more, during blind comparisons between the Empirical Audio Off-Ramp and REF Link using the S/PDIF, I could not reliably tell one from the other. But when I compared the Rifling's AT&T optical with the Off-Ramp's coaxial I could consistently hear differences between the two converters. The AT&T glass optical input rendered depth more convincingly with greater image solidity and dimensionality than the either unit's S/PDIF.

The last conventional DAC/pre I tried with the Ref Link and Off-Ramp was Wyred4Sound's DAC2. On their S/PDIF connections both USB boxes once more I could not reliably identify which USB converter I was listening to. But when I

connected the Off-Ramp 5 via its I²S HDMI input I noticed a change that noticeably increased the Off-Ramp's fidelity. Through I²S the Off-Ramp had a slightly increased image size, as well as greater solidity. Also when I used the I²S' connection with the Off-Ramp, my own live 192/24 concert recordings sounded more relaxed with a better sense of individual harmonic textures and greater spatial cohesion.

The last system I used for A/B comparisons was the NAD C 390DD digital integrated amplifier. Once again I compared the two units' S/PDIF feeds and once again was unable to tell the two units apart during blind listening sessions. But I could readily tell the difference between them and the NAD's own internal USB connection. Both the Empirical Audio and Bel Canto USB were better.

USB Made Simple?

So what sonic conclusions could be drawn from all this listening? The changes and sonic improvements wrought by a USB converter are not merely a function of the device, but also of how it interacts with the DAC that it is connected to. I obtained the best sonic results from the Bel Canto REF Link when it was coupled to Bel Canto's own DAC 3.5 VB via its AT&T glass optical connection. The only situation where the REF Link failed to equal or surpass the Empirical Audio Off-Ramp 5 was when the Off-Ramp 5 was connected to a Wyred4Sound DAC 2 via its I²S connection. In both situations when one of the USB converters sonically excelled, it was because it was hooked up via its "best" connection to a device that supported that kind of connection.

Three Choices

With the introduction of the mLink, uLink, and REFLink, Bel Canto has successfully added the missing parts to create an all-Bel Canto 192/24-capable computer-audio system. If you already own a Bel Canto DAC/pre equipped with AT&T glass optical, adding a uLink is almost a no-brainer way to upgrade your system's sonics. For Bel Canto DAC 3.5VB owners, the REF Link's AT&T glass connection makes for an exceedingly synergistic combination. Even if your DAC is limited to AES/EBU or S/PDIF inputs, the Bel Canto Links can deliver a low-jitter stream that should improve the sound from all computer-audio sources. **tas**

SPECS & PRICING

mLink
Input: High-speed USB type-B receptacle
Output: Coaxial S/PDIF on BNC 75 ohms
Supported sampling rates: 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz
Supported word lengths: Up to 24-bit
Compatibility: Native MAC USB 2.0 compatible on OSX 10.6 and later, custom Windows USB 2.0 driver
Power Requirement: USB Bus 5VDC
Dimensions: 4" x 1.2" x 4.75"
Weight: 1 lb.
Price: $375

uLink
Input: High-speed USB type-B receptacle
Output: Coaxial S/PDIF on BNC 75 ohms, LightLink ST Fiber
Supported sampling rates: 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz
Supported word lengths: Up to 24-bit
Compatibility: Native MAC USB 2.0 compatible on OSX 10.6 and later custom Windows USB 2.0 driver
Power Requirement: USB Bus 5VDC
Dimensions: 4" x 1.2" x 4.75"
Weight: 1 lb.
Price: $675

REFLink
Input: High-speed USB type-B receptacle
Output: Coaxial S/PDIF on BNC 75 ohms, balanced AES on XLR 110 ohms, LightLink ST Fiber
Supported sampling rates: 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz
Supported word lengths: Up to 24-bit
Compatibility: Native MAC USB 2.0 compatible on OSX 10.6 and later Custom Windows USB 2.0 driver
Power Requirement: 120VAC/60Hz or 240VAC/50Hz set internally
Dimensions: 8.5" x 3.5" x12.5"
Weight: 14 lbs.
Price: $1495

ASSOCIATED EQUIPMENT
Source Devices: MacPro model 1.1 Intel Xeon 2.66 GHz computer with 16 GB of memory with OS 10.6.7, running iTunes 10.6.3 and Amarra 2.4.3 music playing software, Pure Music 1.85 music playing software, and Audirana Plus 1.35 music playing software DACs: April Music Eximus DP-1, Wyred4Sound Dac2, Empirical Audio Off-Ramp 5, Bel Canto DAC 3.5 VB, NAD C 390 DD digital integrated amplifier Amplifiers: Parasound A23, Bel Canto M-300, April Music Eximus S-1,NAD C 390DD Speakers: Aerial Acoustics 5B, ATC SCM7s, Silverline Minuet Supremes, ProAc Tablette Signatures, Role Audio Kayaks, Velodyne DD+ 10 subwoofer Headphones: Sennheiser HD 600, Grado RS-1, Ultimate Ears Reference Monitors, Beyer DT-880 (250 ohm), Beyer DT-990 (600 ohm), Audio-Technica ATH-W3000ANV, HiFiMan RE-272 in-ear monitors, Audio-Technica AD-900, Audio-Technica A-700, Sol Republic Tracks HD, B&W P3, Etymotic Research ER-4P, Shure SRH-1440, Stax SR-5, Stax Lambda Pro, Stax SRM-1 Mk II headphone amplifier Cables and Accessories: Wireworld USB cable, Synergistic Research USB cable, AudioQuest Carbon USB cables. PS Audio Quintet, AudioQuest CV 4.2 speaker cable, AudioQuest Colorado interconnect, Cardas Clear interconnect, PS Audio PerfectWave i2s/HDMI cable, Crystal Cable Piccolo interconnect, and Audioprism Ground Controls