



as coaxial, or the balanced AES/EBU. How do they work? Fabulously well, as we would discover. Indeed, we were in for a major surprise, and as you read this report perhaps you will be too.

Before we begin, we should stress that this connection method is useful only if you either have a dedicated computer that is part of your music system, or at least a computer that is only a short distance away from the system. A USB cable cannot be longer than 5 metres. Although it is possible to insert a repeater circuit, that hardly seems like a desirable solution to the distance problem. Running a very long digital cable of any sort can actually cost more than just adding a dedicated computer to the system.

Which is what many audiophiles are choosing to do. We'll have some hints on doing just that shortly. For our part, we have added an aging MacBook Pro portable computer to our Omega reference system. Until now, we had been connecting it to our Moon 300D DAC with our TOSLINK optical cable.

Could an outboard USB circuit do better? We would see.

The M2Tech HiFace

If you expect a "proper" USB circuit to be large and complex, you may be puzzled by the Italian-made HiFace. It's simply a small plastic device with a connector at each end. There are no controls. The HiFace does require a driver for either Windows or OS X, but neither is included. There is only a slip of paper with a link for downloading the one you need.

The HiFace definitely has price on its side. Teac lists it for \$200 (\$220 with a BNC connector instead of the more common phono jack), but street price can be as little as \$150, as we will see in a moment.

Because USB cables are for data only, you might suppose that all cables will give the same result. That's not the case, as we determined with listening tests some time back, but the point is moot, because the HiFace can plug directly into the computer (we don't suggest plugging it into a USB dock). At the other end, you should of course use the best cable possible. We have been

USB INTERFACES

In a perfect world products like the two featured in this review wouldn't even exist. A properly-designed digital-to-analog converter would offer you optimum performance on every single one of its inputs. At the moment, that is mostly not what happens.

We think we know the reason. The most common digital audio connections — coaxial (S/PDIF), AES/EBU and TOSLINK — are familiar to audio engineers because they've been working with them for years, even decades. Until not too long ago, high end DAC's didn't actually *have* USB inputs, because those are computer interfaces meant for keyboards and cameras, not audio circuits. When USB audio inputs finally became common it was as an afterthought. Customers *expected* USB, and so high end DAC makers went shopping for a chip, or even a complete circuit board. On the evidence, most of them didn't spend any more than they had to.

Indeed, some of them didn't even bother Googling USB, otherwise they wouldn't claim, as some do, that USB audio is limited to a 48 kHz sampling rate. That limitation was due not to the

USB standard but to the lousy circuits they had been using. It was in part for that reason that we have been recommending an optical link (many modern computers have TOSLINK outputs, including all modern Macs except the MacBook Airs). And indeed the optical link works very well, well enough that we were getting results very close to those of our Linn Unidisk 1.1 player.

USB's second-class status may be changing, but in the meantime there are special products to the rescue. These two boxes are examples. What they do is run the USB output signal from a computer, through a properly-optimized USB circuit, and then output it through the sort of conventional digital link that audio engineers are familiar with, such

Finally...USB done right. As for us, we were in for a major surprise. You too, possibly.

using the Atlas Opus (now discontinued but still available from The Audiophile Store at \$240), but we have now upgraded to the Atlas Mavros (\$565), reviewed elsewhere in this issue.

For the comparison, we first listened to the music selections with the usual TOSLINK (optical) connection from our MacBook Pro to our 300D DAC. They sound downright terrific that way. Of course there's always something beyond "terrific," a fact that gave us hope.

We began with the *Non Allegro* from Reference Recordings' *Rachmaninoff Symphonic Dances* album. We used the HRx version available on DVD-ROM, essentially a copy of Keith O. Johnson's master recording. This is a 24-bit 176.4 kHz file, but our optical setup requires downsampling to 96 kHz. That's not ideal, but it still sounded stunning.

Of course with the HiFace we could go to the file's native resolution, but not without an odd problem. No matter what we did, the display on our Moon DAC indicated a sampling rate of 48 kHz. The exceedingly brief instructions offer no hint as to the problem, though some research on the company site gave us the solution. Despite what you might expect, the DAC's front panel display doesn't really measure the sampling rate of the incoming signal. The source must *tell* it what the rate is. The HiFace does not meet established USB standards, and it does not give the DAC accurate information. However its driver does give you access to a full range of resolutions, even if they're not reflected by the display.

In any case we certainly liked what the HiFace did to the music. "It's a marriage of digital with the listenability of analog," said Steve, who wondered whether even a live audience would have been able to hear everything we were hearing. The space was huge and well-defined (Keith Johnson usually nails this), with a beautifully natural decay of notes. We thought back to the days of early digital, when the trailing ends of notes would just vanish. At the same time the background was a deep black, lending dynamic contrast to music that has plenty of it. The sound was bright, but in a natural way, without the artificial

"crispness" of bad digital. Or bad *anything*.

Yes, but the recording had been terrific with the optical link too. Was it better with this little USB dongle? It was unanimous. Yes.

We continued with another HRx recording, *Some of These Days* from the Hot Club of San Francisco's *Yerba Buena Bounce* album. Even with the optical link, and its forced downsampling, the album was musically much more interesting than it had been with the CD. In its full resolution rendition, it was much better yet. The lively rhythm was tireless. The violin was natural, not a bit strident. The clarinet had extra body, and the trombone had a lovely growl. The trumpet sound was powerful. The voice was more natural too, and the words especially clear.

And remember that this was in comparison to the same file played with the optical link, not to the original CD.

For the final selection we turned to Fidelio's recording of Dvorak's *Symphony From the New World*. This is a 24-bit 96 kHz recording, which Fidelio gave us on a memory card. We were of course able to play it at native resolution even with the optical link.

The space was well-rendered even with the TOSLINK, but the HiFace blew up the balloon a little, increasing both spaciousness and impact. We could hear that the woodwinds were placed near the back of the orchestra. We wished that the strings had been a little silkier, but there was no confusion, even in the complex passages.

There's a lot to be said for the M2Tech HiFace. It offers what seems to be the best possible link between a computer and a modern DAC, and it gives you access to pretty much any file resolution being used today. True, it lies to the DAC, but you quickly forgive that and revel in the sound. The HiFace also has economics on its side. It costs less than the alternative we were also reviewing, and it doesn't even need a USB cable.

We wish it were prettier, but the



music it makes is gorgeous. We were just about ready to pick one up ourselves. But of course we had another such device to listen to.

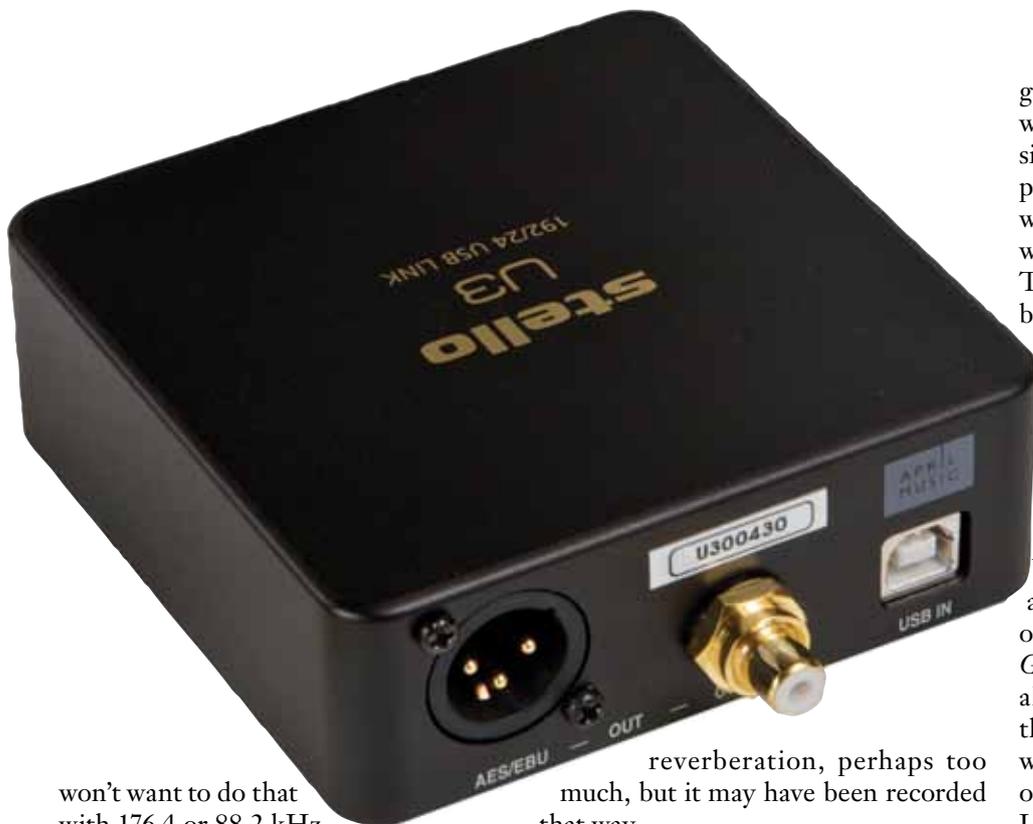
The Stello U3

This USB interface looks like a high end product, and of course it is, resembling an Apple TV. Stello is one of the brand names of April Music, a South Korean company whose products we have reviewed before. Another of its products, the Eximus DPI, is on the cover of this issue. The Stello costs \$495.

Like the HiFace, the Stello has a coaxial digital output, but it also has a balanced AES/EBU output, possibly useful if your DAC has the appropriate input. Like the HiFace the U3 is powered by the computer's own USB circuit. However it requires a cable to link it to the computer. It doesn't come with one, but USB cables are cheap, and if you're like us you have a couple of them lying around.

Ah, but do all USB cables perform the same? Not according to an earlier test (in *UHF* No. 88), in which we tried a premium USB cable from BIS Audio on an Edirol UA-25 converter. The BIS was audibly superior, which came as a surprise. We therefore performed the test with the BIS.

The U3 is supplied with a disc, which includes the instruction manual in PDF form as well as a driver for Windows computers. Our Mac requires no driver. When it's plugged in, the Stello identifies itself as an XMOS USB 2.0 device. It offers a full set of resolutions to match anything available today. We selected the appropriate resolution using our Mac's Audio Devices utility. Note, however, that the utility does not change resolution automatically according to the file being read. If you leave the resolution at 24/192 the data will be upsampled (and the DAC's front panel will read 192 kHz). However you



won't want to do that with 176.4 or 88.2 kHz files. For the purposes of this review, we selected the native resolution whenever we could.

On a Windows computer the U3 will also advertise itself as an XMOS device, which means it will work with no driver. However one of our customers warned us that the results were poor, and that there was a reason the U3 came with a driver. Install it, and all is well.

It didn't take us very long to realize that there was no way we were sending this box back to the distributor.

We began with the Rachmaninoff, and we were pleased to see the red "176" LED light up on our Moon 300D DAC. Our initial impression was that the orchestra was more distant than it had been before, but then we realized that of course it really *should be* more distant, because that's the way a symphony orchestra is laid out. The depth, already prodigious, was increased again. A trace of "edginess" on the strings, just noticeable before, was gone. "The fortissimo didn't hurt my ears this time," said Steve. Albert admired the timbres of the woodwinds, and especially the bassoon. The oboe and the saxophone were improved as well. "The sound is cleaner," said Albert, "yet at the same time there's *more music*."

The piano did seem to have more

reverberation, perhaps too much, but it may have been recorded that way.

We continued with *Some of These Days*, and the performance wowed us even more, because this time everything was clearly better rendered. The violin was silkier and it never hardened up even on loud and complex passages. The clarinet was at once detailed and natural, and Steve swore he could hear echoes *within the clarinet's own tube*. The voice was clear and clean, with added detail in the bottom register.

But those are mere sonic details, and what especially delighted us was the overall musical sound, because that has a direct relation to the performance. Rhythm was communicative, and the music flowed with ease. There was a joyous ambience, which brought us back in our imaginations to the smoky prewar Paris cabaret of Django and Stéphane.

We had one final recording, the excerpt from Dvorak's *New World Symphony*. Because it's a 24/96 recording, we had been able to listen to it natively even with our TOSLINK optical cable. We had liked it, but there were some obvious imperfections. We were about to hear all our doubts swept away.

One of our frequent observations is that digital recording (and everything else) has trouble reproducing violins, and that massed violins and woodwinds typically sound too loud and rather

grating. We had noticed exactly that with the optical link, but there was no sign of those flaws this time. Fortissimo passages were loud, to be sure, but they were *naturally* loud, as they would be had we been at the original recording venue. The violins were clear and even forward, but never annoyingly so. In truth, all of the instrumental timbres seemed natural, and we thoroughly enjoyed the performance.

But we had one more question.

The three selections we had used were high resolution, with 24 bits and either 176.4 or 96 kHz sampling rate. What could this USB interface do with a standard CD? We selected one of our favorites, Margie Gibson singing *I Got Lost in His Arms* from her Sheffield album, *Say It With Music*. We knew that our computer, with its optical link, would sound only slightly inferior to the original CD played on our superlative Linn Unidisk 1.1 player. We returned to the optical link, dialed the resolution down to 16/44, and listened. Sure enough, the song was gorgeous. Could the Stello do better?

It could, and it did. Over the years we have numerous times been surprised to learn that a standard CD could sound so much better than we had supposed, and it was happening once more. With the USB link, it was vastly superior, with finer detail, and more of the emotion that Margie communicates so well.

But we weren't done yet. "I want to try one more thing," said Gerard, dropping the original Sheffield CD into the drawer of our Linn player.

Our jaws dropped. We were left stunned, and we looked at each other awestruck, because the difference was not a slight one. The Linn sounded veiled by comparison, and we didn't even need to take notes. There was a long silence after the piece was done. We had just heard computer audio outperform a player we consider to be the best ever made!

We have other findings that may interest you. The less-expensive HiFace can also outperform our Linn. And when we streamed music from our distant Mac Pro, over Wi-Fi, to our resident MacBook Pro, we would hear no diminution in performance.

Conclusions

That we would recommend both the Stello and the HiFace to you pretty much goes without saying, and of course it reinforced the advice we have been giving you over the past three years or so: don't buy any CD player that doesn't have digital inputs.

However this review had clear implications for us, for our reference systems, and even for our Audiophile Store.

We were, of course, going to be keeping the Stello U3. Our CD listening would be done with it from now on. The Linn would henceforth be reserved for playing SACDs and a rare DVD-Audio.

Albert had been shopping for a new CD player, but wanted to hear this setup in his own system. Subsequently he purchased a used but recent Mac mini for a little over \$300, which has become his "CD" player. He controls it from his iPhone or iPad.

As for our store, we wondered whether we could add some of the products we were about to grace with this rave review. We did. Both the HiFace and the Stello U3 are now listed on our

"digital" page (the HiFace is available in limited quantities, unfortunately). While we were at it we called BIS Audio and asked whether we could buy stock of their excellent USB cable. We could and we did.

Why does computer audio sound better than the best CD player made? Let us attempt a guess.

You'll recall that the Compact Disc format was finalized in 1982, but designed some time before. The economy was then in one of its periodic recessions (of course, we had seen nothing yet!), and, as always happens during a recession, music was number one on the list of budget items that could be cut. There was pressure from Big Music to launch the laser music disc, ready or not. It was a lot more ready than we assumed, but it bears the marks of its rushed development.

In particular, though the naysayers like to say that "bits is bits," in fact the digital data is recorded on the CD in *analog form*. The pits in the aluminum (actually the "lands," seen from the other side) don't directly correspond to digital

data. Rather, the length of a "land" (which is of course an analog value) expresses how many zeros must go by before a one appears, or vice versa. These analog values must be read in real time from a rapidly spinning disc, turned by a mechanism whose precision has little in common with that of a Swiss watch. You can see the problem.

A computer hard drive is different. Data is actually stored as a sequence of ones and zeros. Just as important is the fact that the data is loaded into computer memory before being turned back into analog sound, which means you don't have to worry about the quality of the drive's bearing.

Of course if the source of the music file is a CD, the problem remains of getting it off as accurately as possible. There are competing software packages available claiming to do this better, and you can expect us to write about this topic in the future.

It happens now and then that a review session is so revealing that it changes our minds about the very nature of our work. This was such a session.



CROSTALK

Look, I really hadn't expected this. Yes, I knew that audio from a computer could be very good, that it could rival the very best disc players, because I had seen it again and again. But "rival" is not the same as "beat." "Rival" is not the same as "grind into the dust."

Not long ago I considered computer audio to be a convenience, the same way that a CD changer was, only much better. Sure, there was a performance hit, and you'd expect that, and you accepted the tradeoff.

Well, forget the tradeoff. Audio from a computer can be far superior. And that's good, because more and more companies are getting out of the CD player business. "Associates" at big-box stores don't even know what they are, and the newest cars don't have CD slots anymore. Welcome to the future.

Only it's not the future anymore.

—Gerard Rejskind

Imagine the scene. A huge crowd has

gathered in front of the castle walls, nervously awaiting the arrival of the two heroes. The enormous doors open slowly, and the crowd, lined up on either side, suddenly bursts into cheers as the two minuscule giant-killers emerge, casting long shadows: the Stello U3 and the M2Tech HiFace.

Add one of them to your system and you'll be cheering too. And you'll soon be scrambling through your hard disc, uncovering musical gems, hidden under the guise of ordinary files. The highest quality files will be revealed to their full potential, but that was not the most important realization that I had. By far, the most impressive result was the giant-killing quality that was uncovered in ordinary 44.1 kHz files.

No need to wait for rare 192 kHz recordings, some of the future is already here. Now!

—Albert Simon

Keith Johnson and the folks at Reference have done it again. They are selling digital music recorded at a resolution rate of 176.4

kHz, and in so doing are setting the standard for others to match. As more recordings become available at this high a resolution, how to prepare for their arrival?

Can your system let you hear this much extra digital beauty, with either of these USB interfaces plugged into your computer source? The answer is a cheerful *yes*, and an even cheerier *guess what else they can do*. If you use a modern DAC, then either of these devices will give your Reference Recording all that they need to show their real stuff.

That's all well and good, you might say, but my CD collection is mostly 44.6, plus I have a few 24/96 downloads. So can this thing give me any improvement to my present reality? The good news is that each of these interfaces adds detail, presence and transparency to both Red Book discs and high-res downloads. Both really and truly change the quality of all of the music I heard today, no matter what digital format was playing.

—Steve Bourke