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M2Tech hiFace 24-bit/192kHz USB Digital Audio Interface
A journey into the world of PC audio.
Review By Mike Galusha
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 I built my first dedicated audio PC in about 2001 and until now I was never happy enough with the results to keep a PC source in my system. During this time I have tried various sound cards and USB devices and ultimately ended up using a highly modified Squeezebox as I preferred that over a Parts Connexion modified Denon 2900 and the various PC based sources. Over the years I have modified the Squeezebox repeatedly until it finally ended up with a vacuum tube output stage and 5 discrete power supplies for the various parts of the circuit. The result was and is very satisfying but the lack of high resolution playback has bothered me for a while, especially with the increased availability of 24-bit/96kHz downloads.

There are several high end sound cards such as the Lynx L22 or the ESIJuli@ that will provide this capability but using one of these means a full size PC with an available PCI or PCI Express slot. Unfortunately building a truly silent PC is not a trivial task because of the cooling requirements. There are ways to do this but inevitably this becomes an expensive project and essentially out of my budget.

Enter the M2Tech hiFace USB S/PDIF Output interface. This nifty little device will allow output of up to 24-bit/192kHz S/PDIF from a USB port. The hiFace looks a bit like an oversize USB flash drive with an RCA or BNC connector on the opposite end. Using a USB device allows one to employ a much smaller and easier to cool computer and I ended up with a "nettop" class of machine. This is much like the netbook laptops using an Intel Atom processor and a 2.5-inch hard drive. Passive heat sinks are enough to provide cooling without fans and the small hard drive is very quiet and inaudible from my listening position, avoiding the expense of a solid state drive. Unfortunately most of the USB devices, either DAC or S/PDIF output do not support the highest resolutions available and often use the PCM2702 from Texas Instruments, which is limited to 16-bit/48kHz. There are some very nice USB DACs available from Ayre Acoustics and Wavelength Audio to name a few but for the low budget audiophile like myself they are still a stretch of the wallet.

The M2Tech hiFace operates asynchronously with two high precision clocks covering the multiples of 44.1/88.2/176.4kHz and 48/96/192kHz. These clocks have a claimed precision of 2.5 ppm and very low phase noise. The use of a high performance transmitter allows the output to have extremely low jitter and M2Tech employs a pulse transformer to provide galvanic isolation from the computer. At this time M2Tech offers drivers for both the Macintosh and Windows operating systems. Linux support is forthcoming. Since my day job is working with Windows based machines I don't have any experience with the Macintosh version and look forward to giving it a go under Linux once the drivers are available.

With the hardware issues addressed that leaves the integration with your computer. Unfortunately use on a computer with the Windows operating system introduces problems, the main being the kernel mixer, also known as KMixer. This bit of software resamples the audio data after the playback application and generally ensures non bit perfect playback, so the data going to your hardware is not the same as the data from the file. Obviously this is not good; fortunately there are ways around this. On XP systems ASIO (Audio Stream Input / Output) has been developed and is supported by a number of vendors. There is another method known as kernel streaming, this takes advantage of a Windows API that allows real time streaming to audio and video devices. It is supported in some music players, usually via a plug in. Windows Vista and Windows 7 have a new piece of software called WASAPI, this stands for Windows Audio Session API and does contain a mode to allow direct streaming of audio data to the playback devices, bypassing all the mixing functions. Kernel streaming will also work under Vista and Windows 7.

The hiFace is primarily designed to use kernel streaming under Windows, regardless of version. This ensures low CPU utilization even at high bit depth and sampling rates and allows for a highly optimized driver. M2Tech supplies proprietary drivers for the device since it does not support the usual plug and play USB audio device protocol. A player supporting kernel streaming is required to take full advantage of the hiFace. Such players include foobar 2000, Winamp and Media Monkey. I have been using foobar with great success.

While getting all the parts to work together is not terribly difficult for the PC savvy, it can be a daunting task for those with little computer knowledge, especially if your music files are stored on a remote system such as a NAS device. Fortunately M2Tech has a fairly extensive FAQ on their web site as does the US distributor. The distributor for your country may have helpful information available, it would be worth checking.

Enough Blah Blah About PC Audio
How Does It Perform?
The short answer is incredibly well, at least in my system. In the last couple of months I completed building two DACs based on the ESS ES9018 Sabre32 DAC chip. These started life as the first generation "Buffalo DAC" kits from Twisted Pear audio. They sat on a shelf for many months before I finally had a chance to do something with them. In the time since they were originally acquired ESS released the ES9018 32 bit chip and it turned out these were pin compatible with the original ES9008 chip, some hunting turned up a source for the new chips. I transplanted the DAC chips and set about building a pair of DAC's, one for myself and one for a buddy. The one for my friend sports a tube output stage with 12B4 triodes and Gary Pimm's CCS modules with the output coming off the mu follower connection. This allows for a very quiet output stage to take advantage of the stellar noise specs of the Sabre32 chip. Dedicated power supplies were built for the analog, digital and clock sections. The one I built for myself is the same except for the use of transformers on the output. I mention all this because one of the features of the ESS Sabre32 chip is the use of a "Patented Time Domain Jitter Eliminator" offering the benefit of "Unmatched audio clarity free from input clock jitter". In my mind this means that a DAC built with this chip should be very insensitive to the S/PDIF source.

My listening sessions were surprising; I did not expect to find much if any difference using various S/PDIF sources and was mainly looking for the ability to play high resolution files. I tried a small variety of transport mechanisms with both DAC's and all sounded somewhat different. All

were good but the M2Tech hiFace won the day on both standard Red Book CD and high resolution data at 24-bit/96kHz and higher. The sources I had available were the S/PDIF output on my Squeezebox, a Logitech Transporter (via BNC output) and my PCX modified Denon 2900 universal player. The Denon has an LC Audio LClock XO 3, which should allow it to provide a high quality S/PDIF output. I also compared two versions of the hiFace, one with the standard RCA jack and one with the optional BNC jack to provide a true 75 Ohm connection.

Over a period of several weeks I listened to a variety of both high resolution and standard audio via all the sources, creating a DVD-Audio disc of the same tracks to play in the Denon and of course ensuring it was set to not re-sample the audio going to the S/PDIF output. For all listening I used a cable made from Belden 1505 coax with 75 Ohm BNC connectors. The DACs were built with very high quality 75 ohm jacks and used RG179 coax from the jack to the board, terminated carefully to keep unshielded portions to a minimum. For the RCA output sources I used a BNC -> RCA adapter that came with a Stereovox cable.

My order of preference from least to most is the Denon 2900, modified Squeezebox, Logitech Transporter, hiFace RCA version and finally the hiFace BNC version. I was surprised the hot-rodded Denon did not fare better as a transport but my notes place it firmly at the bottom of my available sources. I keep it only because I have 60 odd SACDs, which of course I cannot play via any of the other methods. The Transporter was fairly close in performance to the hiFace but the bass was muddier and high frequencies such as triangle and cymbals had a kind of extra splash to them that just didn't seem as natural as the hiFace. The presentation was also more forward and aggressive, which is the only term that really seems appropriate.

The differences between the hiFace's were subtle but the BNC output resulted in more low level detail and greater sense of air and space. The BNC version seemed to present more information but was simultaneously more relaxed. I suspect this is due to a more accurate transmission of the signal since there is no impedance mismatch from the RCA plug as there are no internal differences between the RCA and BNC versions. The overall sound of the hiFace/Sabre32 DAC combo is something quite special, especially when playing high resolution recordings. While Red Book recordings are reproduced in an exemplary fashion, queuing up a 24-bit/96kHz album such as those from HD Tracks just lends a naturalness and ease to the music along with more ambiance and other low level detail cues. The HRx releases from Reference Recordings are truly stunning and in my mind define what is possible. Listening to the HRx discs I can't do anything except listen, I am just sucked into the music and all the typical audiophile jargon no longer applies, the music is just so alive and present that it demands your full attention. When the kids asked what I wanted for Christmas it was easy, more HRx discs. It's a good thing the hiFace is not expensive, that leaves more money to spend on hi-res music.

In the interest of full disclosure, the US Distributor for M2Tech is a friend but I purchased three of the hiFace devices for my personal use. Steven contacted me several weeks later and asked if I'd be willing to review them, so the units reviewed are mine and not on loan. I don't see a conflict of interest but I wanted to be sure everything was transparent in case others might question this.

The curious reader might ask, why three of them? Easy, one for my dedicated system, one for work and one to hack, but that's another story...

Current System Configuration

Source is the hiFace feeding my DIY Sabre32 DAC

Preamplifier is a DIY design using a 6SN7 gain stage, Pimm CCS, Pimm/Swenson regulator and all film capacitors.

Amplification is either Consonance Cyber 845 SET or McIntosh MC275 running full differential via Lundahl transformers.

Speakers are GedLee Abbeys with three GR Research/Rhytmik Audio servo subs.

Power and speaker cables are Kaplan Cable GS.

Interconnects are a combination of a DIY design using Neotech solid silver and some milspec 26ga x 3 shielded Teflon for the balanced runs.

Dedicated 20 Ampere circuits with Jena Labs cryo outlets and 2 BPT 2.5 Ultra balanced power conditioners.

Tonality	♪♪♪♪
Sub-bass (10Hz - 60Hz)	♪♪♪♪
Mid-bass (80Hz - 200Hz)	♪♪♪♪
Midrange (200Hz - 3,000Hz)	♪♪♪♪
High Frequencies (3,000Hz On Up)	♪♪♪♪
Attack	♪♪♪♪
Decay	♪♪♪♪
Inner Resolution	♪♪♪♪♪
Soundscape Width Front	♪♪♪♪
Soundscape Width Rear	♪♪♪

Soundscape Depth Behind Speakers	♪♪♪♪
Soundscape Extension Into Room	♪♪♪♪
Imaging	♪♪♪♪
Fit And Finish	♪♪♪
Self Noise	♪♪♪♪♪
Value For The Money	♪♪♪♪♪

Specifications

Type: Digital to analog converter
Input: USB A type male, USB 2.0 format
Output: RCA or BNC female S/PDIF
I/O Standard
Sampling Frequency: 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4khZ, 192kHz
Resolution From 16 up to 24 bits
Dimensions 10.2 x 2.2 x 2 (DxHxW in cm)
Power Supply 5V DC from USB bus
Temperature from 0° to 70° C
Weight: 1.75 ounces approx.