DSD versus PCM – a debate that should not exist.

Many audiophiles must be tired of hearing all the competing claims about DSD versus PCM – the two main audio formats. At Baetis we simply build our computers so that you always can use the very best audio output type – USB, SPDIF, AES-EBU, Toslink, HDMI, or Ethernet port – for whatever sounds best to your DAC. We do however have some strongly held views about DSD and PCM, which in turn feed in to our view about some DACs.

First, we have tried just about every way of playing either PCM or DSD. We agree with those engineers, such as Cookie Marenco, one the leaders in the industry of <u>mastering</u> native DSD files, with regard to DSD versus PCM. Cookie says essentially that if the album is mastered in DSD it should be played in DSD, and vice versa. That is, an album that is mastered in PCM sounds best if played in PCM.

The fact of life, however, is that the <u>vast majority</u> of DSD albums or DSD downloads are albums that were mastered in PCM at a very high bit rate. Then, the master computer file, consisting of the master WAV file, was compressed 3 to 1 via conversion to DSD (e.g, when being burned to an SACD). In computer file terms, such an SACD, when ripped (by a professional SACD ripping company) then exists as a DSF or DFF computer file. Same thing with a DSD download – most likely, the download will be a folder with individual tracks whose computer file names end in <.DSF> or <.DFF>.

If we always knew how the <.DSF file> was mastered, we'd play it in the master format – DSF or WAV. But most times, we simply don't know. So we generally convert the DSF file to WAV, using our powerful computer and the JRiver software. The result is often spectacular, and *usually* way better than playing the DSF file the way many audiophiles do – via DoP over a USB port. DoP stands for "DSD over PCM". In fact, this method uses the PCM format as a "carrier" for the DSF signal, and most "DSD capable" DACs will then play this not-really-a-native-DSD file easily via the USB input of the DAC.

We find, however, that transcoding the DSF file to WAV while playing over the SPDIF or AES port of a Baetis computer almost always sounds better than using the DoP via USB method. This AES is better than USB result holds even when using our optional USB ports via the SOtM™ USBhubIN card with separate clock board – which is the very best USB because it does NOT use a PCI bus but rather comes from a header on the MB, just like our SPDIF and AES (see our Custom Shop or options on our various models).

The trouble is, however, that <u>not all DACs have truly good SPDIF or AES inputs</u>. Some DAC designers simply assume that if a computer is doing the playing, the computer will be using its USB port – hence the industry developed DoP (via a USB port) as a way to play DSD files. Sometimes these DAC engineers spend very little money on their SPDIF or AES inputs (and many DACs don't even have an AES input), because very few of their customers will be playing music through anything other than a USB port of a factory computer. Indeed, many of the writers in the audiophile magazine industry think that USB is what we mean when we say "audiophile computer." And it has been only very recently that these writers have migrated to playing music via AES or SPDIF ports from a music server – partially due to the continual nagging we've been doing over the last 5 years <u>to avoid USB</u>.

At Baetis, we have a load of accumulated experience – either directly or via our clientele – about what ports on a DAC sound the best. Some brands and models of DAC we view as "USB-centric" – meaning their AES inputs (if the DAC has one) or their SPDIF inputs are not remotely as good as the AES or SPDIF

inputs of some other DACs. In dozens of cases, we have sold one of our computers to a client with such a USB-centric DAC, then advised the client to audition another DAC – what we might call an AES-centric DAC. In the vast majority of cases, the client has sold the USB-centric DAC and purchased a new, non-USB-centric DAC.

Sure, we would love to be able to play a <.DSF file> (that was mastered in DSF) through an AES or SPDIF port on a Baetis computer. But unfortunately, there are no DACs that we or our clients have yet auditioned that do so. The DACs only can play a native DSD file via the DAC's USB input.

There are even some new models of DAC that convert all incoming PCM files into DSD before the digital-to-analog conversion process. We can tell you that from a theoretical view, there is NO advantage to such a conversion, when the album was mastered in PCM (as more than 95% of all albums have been). In every case where such a DAC has participated in a well-conducted a/b audition, the "DSD-capable" DAC loses to a good PCM DAC of similar quality and price. Since the vast majority of music is available only as PCM, and since the vast majority of DSD music was originally mastered in PCM, we do not think you should spend much time worrying about having a "DSD-capable" DAC. Rather, you should buy the very best PCM capable DAC you can afford.

Above all, we must warn you against purchasing some DAC that claims it is "DSD-capable" when in fact:

a) It only does DSD via DoP via USB
b) Its USB input plays PCM files at a much lower level of quality than the AES or SPDIF input of a "PCM-only" DAC.

Please, do NOT purchase a DAC based on a reading of its capabilities. Only by auditioning a DAC can you know how it sounds. But then, if you are auditioning the DAC via the USB port of a factory computer, well, how in hell does that compare to auditioning via the DAC's AES input or SPDIF input using a Baetis computer?   The answer is – you cannot believe what a difference the Baetis SPDIF or AES output makes versus that of whatever brand of music server or computer you are now using via the USB output of the server.

Now we come to a main point that we wish you to think about. Please go back and read those written reviews of that DAC you were thinking about buying. Ask yourself, through a careful reading of the review, what specific inputs of the DAC the reviewer tried. In the VAST majority of such reviews, the writer uses only a single input to the DAC (USB) because his media player consists simply of a factory MacBook Pro or Mac-mini or Dell laptop. In such cases, yes, USB is best way to play audio (because the writer doesn't even have an AES equipped music server). But USB is NOT the best output from the world's best media players. Only SPDIF and AES can product the highest quality audio into good PCM DACs. And don't be fooled by price -- there are truly great PCM DACs out there for less than $2000, and there are truly atrocious "DSD-capable" DACs out there for 3 times that amount.   Only with a Baetis computer is every DAC in the world "DSD capable" – because of the Baetis' industry-leading manner of transcoding DSD to WAV on the fly. And when the writer says "this is the best DAC I have ever heard" please find out what "server" he is playing from. The server is as important as the DAC in creating the best sounding digital music.

Read. Learn. Question. And, above all, AUDITION.