MASTER FIDELITY NADAC D AND C: BREAKTHROUGH SINGLE BIT CONVERSION

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SUMMARY

The competition has something to think about with the arrival of this NADAC D and C.
In the modest perception of your reviewer, a new reference point has been set in the market.

PROS

- Realistic and natural sound
- Enormously clean and pure sound
- Extremely low noise floor results in a wall of natural detail
- Comes at a price, but that can be explained based on what you get in return

CONS

- Nothing, but you can still look greedily at the available NADAC C clock
- …

In 2024, Master Fidelity announced the NADAC D, a completely newly developed converter and the accompanying NADAC C clock. These were listened to in various locations, including your reviewer's listening room. The experience was downright shocking and embodies a new reference point.

Realistic reproduction has been referred to in various reviews before. The pursuit of this is most likely reserved for a very small group of music lovers and often seems like a niche market. Roughly 80 percent of consumers are probably not interested in a much better reproduction quality. Most have simply never heard it. They just want a nice sound, bells and whistles and that is fine.

Nevertheless, since the advent of the phonograph there has always been a pursuit of reality reproduction. It is the basis from which pioneers such as McIntosh, Leak, Quad, Fisher and others worked and the subjective assessment of audio components, as introduced by J. Gordon Holt and Harry Pearson, actually forms the basis of audio journalism. The underlying goal is to compare with reality. You make a statement about how close you come to it. You can let go of that basis, but then you lose the essence of your existence as an audio journalist. As a manufacturer you are also rudderless; you then go with the flow of what the market wants. No further value judgment. Everyone must make their own choice.

Realistic reproduction

There are several companies, scientists and journalists, including your reviewer, who have been researching for decades how audio equipment can provide the most realistic reproduction possible. Perhaps you should just use the term 'natural reproduction'. You then run up against specific limitations of the electronics, speakers and the typical stereo reproduction. One discovery is that realism in reproduction is almost never dependent on a single aspect. It is often a specific combination of the speakers, the electronics and also the recording. Record players and converters can also sound more realistic to a greater or lesser extent.

Recordings of small ensembles make it somewhat easier to achieve a realistic reproduction. For various reasons, it is more difficult to reproduce the scale and power of a large orchestra as realistically as possible. Anyone who can play with the various variables can create the most realistic illusion of reality possible. You can then observe that reality itself is an illusion. That is correct. As a human species, our senses are primarily built to make observations in a three-dimensional world.

Sometimes it is said that this whole three-dimensional world is simply a computer model. We may just be a game of some supernatural government in it.

After years of experimenting, a number of variables have been identified that can be used to create a reasonably realistic representation of smaller ensembles in particular. Ultimately, you run up against the limitations of stereo reproduction. Multichannel sound offers an improvement in this. Your author has listened to various multichannel systems. That does not mean that you immediately experience the pinnacle of realism, but it is a further and convincing step in that direction. Apart from various home theater enthusiasts, multichannel has never really taken off for pure sound reproduction, despite the knowledge that there are still beautiful multichannel SACDs and Blu-rays available.

Digital does not sound realistic

The basic problems with digital and stereo reproduction are that digital rarely sounds realistic and that sound systems hardly ever create a three-dimensional 'tangible' image of voices and instruments. It is also often a semi-spatial collage of cardboard images. Flat, without any coherence and positioned on a curved line far behind the speakers, without dimensions in height or depth. As a listener, you are looking at that sound from a distance, as it were. From the sidelines, because you are not included in the acoustic environment in which that sound is played.

The simplest explanation for the lack of a real three-dimensional image of a voice or instrument is that they have an almost spherical appearance. The images that a hi-fi system creates are phantoms that certainly do not radiate three-dimensionally.

Over the years, digitalization has resulted in techniques that are better able to create a holographic space with three-dimensional instruments and voices. With Dolby Atmos, you can literally place 3D objects in selected places in a space. To make Dolby Atmos sound truly immersive, you need a lot of speakers. The first generation of professional systems was based on 128 audio channels divided over 64 speakers. You can also route the tracks to 5.1, 7.1 or other configurations. The more channels and separate speakers, the more realistic the effect will be.

Over the years, various audio manufacturers have come to realize that placing 64 speakers in a living environment was sometimes received with less enthusiasm by housemates. Marketers found solutions using soundbars, headphones and add-on speakers that had to reflect missing channels via the ceiling. Largely a surrogate to fill the cash register and saddle the consumer with a dead bird. That does not mean that a very well-designed system in a 5.1 to 9.1 configuration could not let a small part of that immersive sound be heard.

Apart from spatiality, sound, dynamics and other aspects also play a role in our experience of reality. Whether the end result sounds realistic does not only depend on whether the signal is digital. Serious designers of converters have been looking for techniques to make digital sound more realistic for years. Without wanting to disparage others, good experiences have been gained in the listening room with the converters from Ideon Audio, Berkeley Audio Design and Master Fidelity. Buying a converter, amplifier or turntable that sounds more realistic does not necessarily mean that the entire audio system will perform realistically. Realism depends on several factors.

Not always a question of money

In the Netherlands there are a handful of people who can build a really good audio system. Unfortunately, it is not so simple that this only has to do with money. If you really know what you are doing, you can build something with hifi from the fifties to the eighties that you have collected on Marktplaats that performs very realistically. On the other hand, most systems with price tags in the hundreds of thousands perform extremely average and disappointingly. For example, you can buy a very expensive Red Bull RB21 and think that you will win the race. You may then have a good starting

point, but what is achieved with it is still largely dependent on the driver and the cooperation within such an entire Formula 1 team. The sum of the parts.

Do you need the most expensive audio components? Each component has an optimum curve. As you spend more money, the performance increases, but that is not always the case. Then you reach the optimum. If you continue to invest, the performance may increase somewhat in various aspects, but hardly any more fundamentally. What you get no longer fits the purchase price.

Note that there can always be that one and extremely rare exception. You can still have a discussion about that, but the optimum for amplifiers is between 9 and 30K, for converters perhaps between 12 and 30K and for record players between 4 and 25K. If you really choose well, you will have a product with a performance of approximately 95 percent within this price range and that applies at least to the MF converter.

Bert van der Wolf

Bert is one of the most respected producers and recording and mastering engineers internationally. From his company Northstar Recording Services he works on productions for labels and artists and in the form of Turtle Records he releases his own material on the market. He is also an importer of mainly professional audio equipment. Bert has been on a quest for a more realistic sound reproduction for decades.

Like the undersigned, he has discovered that realism does not depend on a single factor. A nice example is playing 78 rpm records (shellack) on a gramophone with a horn. Although that sound is not the most subtle, it has an unprecedented realism. Fast, dynamic, tangible and with an enormous room-filling energy. How is that possible, and why does digital – and also many record players – not do the same?

Realism

Prior to the analysis, we listened to the reference system in Bert's studio. In short, Bert has a ten-channel system with an Auro/3D configuration, but additional phantom images on the sides. Bert knows that realistic sound depends on the way of recording, a very special microphone technique, the architecture of the playback system and the quality of the conversion and amplification. The power amplifiers are therefore the Naiu Lab ELLA MKIII Power Amplifiers, which are affordable and a very dangerous competitor for almost all higher-priced power amplifiers from other manufacturers.

Do not think that the listening experience is one where you hear all kinds of sounds behind, to the sides and above you like in a home theater. There is simply a stage in front of you with voices and instruments that are 3D and the experience is downright spectacular. If you are talking about an almost super-realistic sound experience, then you have to hear this. Simply unprecedented. Listening to the recorded material in stereo obviously detracts from that realism, but thanks to Bert's recording techniques, much of that spectacular spatial realism remains.

Digital

Here is a global evaluation of a complex object, because there is no editorial space to go deeply into the technique of conversion. Each manufacturer has its own ideas about conversion. Basic techniques are multibit, single bit (bitstream) and PWM. The latter is a combination of both of the previous ones.

Philips introduced the single bit technique in the eighties as an answer to problems with multibit. Single bit offers great advantages over multibit, but is difficult to implement properly. Single bit later became the basis for the DSD format. Single bit is by definition linear. In my opinion, the transfer function only has two defined points.

Single bit also has its challenges. In those years, Philips introduced the TDA1547 converter in combination with the SAA7350 bitstream circuit. Later, Philips introduced the SAA7323, the well-known DAC3. The very first Jadis JS1 converter was built with two SAA7323 DACs in a dual-differential configuration. The undersigned recently listened to such a device. Believe it or not, it is still one of the best sounding redbook converters.

The industry has of course found all kinds of solutions for the problems with DACs. The Grimm MU-2 does not use a single bit architecture, but a 1.5 bit approach. Advantages are the linearity of amplitude and linearity over the entire dynamic range. It does require some computing power. You can achieve that if you place the logic in an FPGA. The Mola Mola DAC starts with upsampling and conversion to a noise-shaped PWM. Two mono dacs and a filter then convert the signal to analog with a very good signal-to-noise ratio (130 dB is at the theoretical limit for real 24-bit processing). That is a value that you do not achieve with the well-known off-the-shelf DAC chips.

Master Fidelity

MF states that the well-known chips that everyone uses in converters are excellent but also simply industrial products that do not achieve the ultimate performance due to a cost aspect and limitations of the 'chip'. A better solution is to 'store' discrete components in an FPGA/CPLD chip. If you then do the conversion to analog, you need logic circuits that should be specially suited for audio. Unfortunately, these are not available and then, according to MF, you have the same limitations as with the industrially produced standard DACs.

MF comes with the first real 1-bit converter. They indicate that all existing solutions still have non-linearities. Philips has not built a 1547 for years and the technology behind it is outdated by today's standards. Making a 1-bit DAC is a huge challenge. There are no chips available on the market to do that. MF therefore had the necessary chips developed itself. It is a discrete DAC, housed in an ASIC. Such a chip contains a number of functional blocks at a logical level, such as processors, logic gates and memories. You first design an ASIC and then it is made. So it is not a programmable chip, like an FPGA.

Then there are extreme requirements for the clock and the power supply, otherwise it simply does not work. The NADAC D therefore has power supplies in an internal housing that are continuously kept at the same temperature. The same goes for the clock circuit. In addition, various adjustments such as an optimized Amanero USB interface and an isolation unit that reduces jitter to values that can hardly be measured. The performance of the NADAC D can be further improved by adding the NADAC C. That is a very advanced clock. MF has discovered that the clock has an enormous influence on the extent to which digital sound is considered natural.

Listen

The NADAC D clearly plays in a different league. A sound that the undersigned does not know from other converters. That may seem an understatement, but the NADAC D has left a crushing impression here. This converter can of course be described with the usual audiophile terms such as transparency, dynamics, spatiality, sound, speed and detailing. These are all state-of-the-art, although it should be noted that the spatial representation has a truly gigantic 3D size. The level of detailing is also exceptional. It is not the hyped-up hyper-detailing that hi-fi equipment sometimes produces. It is a whole layer of information that plays in the background, of which you are barely aware and that contributes to a completely natural experience. In concrete terms, it also means that you can set the audio system to a whisper-soft volume and still literally perceive everything. The extinction of sound can literally be followed down to the noise floor.

A custom set was built around the NADAC D in the usually empty listening room. The special thing about the NADAC D literally reveals itself after two minutes of listening, but it is quite difficult to put

it into words. Listening to a complex piano composition, you suddenly notice strokes that normally pass you by. This is strange, because these are not soft strokes. You are somehow much more aware of what is happening. Also the size mapping of voices and instruments is perfect. That whole stage has a higher level of organization. It is more plastic, much more three-dimensional and perfectly placed. The mapping of depth is very good. The sound is more organic, has a level of realism and demands utmost involvement. Even very old CDs sound amazingly good.

The key concept here is naturalness. The NADAC D actually sounds very ordinary, in the sense that the natural sound around us also sounds completely normal to our ears. It is very non-digital. Somehow, digital sound, no matter how good, still has a kind of irritation factor. You are not always aware of it, but it does play and often reaches a kind of saturation point after listening to digital for a longer period of time. With the NADAC D that is not the case. The sound is very natural, you really miss that irritation in the background and it simply feels liberating and relaxed. Something has fallen away that is actually difficult to capture in words.

It seems as if the NADAC has a kind of fundamental 'rightness'. We all know the phenomenon that a CD sounds good on one converter and then on another converter there is something wrong with the violin or the vocal. Audio demonstrators therefore choose demo tracks that perform best on their converter and system.

On the NADAC, almost everything sounds good. It suffices to simply mention Bert van der Wolf's recording of the six Bach Sonatas for organ, played by Aart Bergwerff on the organ in Ansbach (Challenge Classics/Turtle Records/SACD). The advice in the liner notes is to possibly equip the audio system with subwoofers. So two 5 kilowatt subs were dragged from the studio's warehouses and tuned into the system. What happens then is astonishing. Literally as if you are standing in that church. Sound with depth, height and an astonishing 3D spatiality. The sound that the NADAC D produces is also phenomenal.

Epilogue

Merging Technologies, now owned by the Neumann / Sennheiser group, is a company that builds professional audio. Almost all major audio engineers work with recording and mastering equipment from Merging. Think of Edison Production Company / Northstar Recording, TRPTK and Channel Classics. Even Steinway Lyngdorf, one of the manufacturers that builds realistic performance loudspeaker systems, purchases technology from Merging for their multichannel applications (ZMAN module for 16-channel audio).

It was not possible to continue building the former Merging NADAC products, due to the global crisis in the availability of components. A complete redesign was therefore necessary and that task has been assigned to partner Merging Fidelity. They operate under the name Master Fidelity and came out with the completely new NADAC D and NADAC C in 2024. So basically purely professional products. Professional audio and video usually has a much better price-performance ratio in the experience of your author. In any case, the competition has something to think deeply about with the arrival of this NADAC D and C.

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