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## NuPrime DAC-10H Digital to Analog Converter with Headphone Amp

By John Grandberg • Posted: Jul 28, 2015



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NuPrime. While initially conjuring thoughts of a mortgage lending company, the name actually makes sense considering the company history. You see, NuPrime is a "new" firm made using tech and talent from what used to be NuForce. That brand was bought out by Optoma, a company best known for their video projectors, but the high-end line was passed on to NuPrime. So it could be said NuPrime is just NuForce focusing on their "Prime" market as they did back in 2005. Make sense?

Readers who haven't been around a while probably don't remember a time when NuForce was solely focused on more serious gear. Their first offering, the Ref 9 monoblock amps, used proprietary Class D technology and went for \$2400 a pair. By the time it evolved to version 3 several years later, MRSP had climbed to \$5k. Various other amps, preamps, and integrated amplifiers in their catalog all had 4 figure price tags. They even had a \$5500 pair of speakers, the rare yet well received S9. NuForce was at the time considered high-value high-end, approaching state-of-the-art sound without costing the equivalent of a BMW as many competitors did.

A few years after their debut, NuForce did break their typical pattern by launching the Icon DAC/integrated amplifier and S-1 speakers. This was a small system, aimed at desktop listeners and costing a mere \$500 for the complete setup. The S-1 speakers received a few decent reviews but the little Icon amp really got the lion's share of attention—I saw favorable write ups all over the place, [including Stereophile](#).

There weren't all that many USB DACs on the market as that time, so that aspect probably worked in its favor. Not to mention the recession that was just then hitting its stride, meaning affordable gear was far more likely to sell than expensive stuff. But whatever the case, it seems NuForce sold quite a few of the little Icons...enough where it made financial sense for them to



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launch an expanded selection of small, affordable products in the Icon range. In time, it seemed NuForce became better known for things like the Icon HDP and uDAC budget models rather than their big amps.

Fast forward to late 2014 when, out of the blue, I get an email containing a press release. Optoma has purchased NuForce. I didn't see that coming at all! I assume their plan is to offer a semi-complete package of audio-video products, lacking only speakers (for the moment at least). Which makes sense on some level, at least from a marketing angle. However, the highest models in the existing NuForce line—a preamp, an integrated, and two different monoblock amplifiers—went over to NuPrime, making for a slightly confusing scenario where NuPrime handles NuForce products, and NuForce (Optoma) handles different NuForce products. I anticipate this will be straightened out soon enough as refreshed designs cycle through for each company.

While there isn't a ton of NuPrime gear in the catalog as of yet, one of the very first models launched did strike me as something worth checking out. The DAC-10H (\$1,795) is their all-in-one DAC, preamp, and headphone amp, designed to sit at the heart of even a fairly complex setup thanks to having more inputs than we usually see on a device of this type. What really got my attention is the balanced headphone output on front using the 4-pin XLR connector—the standard which all balanced connections should use in my humble opinion. Plenty of DACs and integrated amps have a headphone jack on front, but very few have a true balanced output. I feel it indicates a certain level of headphone-credibility, as if to say "We take this headphone thing seriously". The DAC-10H also has a standard 1/4" jack for unbalanced headphones, which is always good to fall back on. This somewhat unusual feature set, combined with my high regard for the last NuForce DAC I tried, was enough to prompt me to arrange for a review sample. And I have to say I'm glad I did.

The first thing that struck me about the DAC-10H was its size. Not the width, which is a mere 8.5 inches or "half-width" as it is sometimes known. Nor the height which is a rather manageable 2.3 inches. No, what got me was the depth: a full 15 inches. Many full-sized high-end CD players and preamps are only in the 13 inch range, yet this half-width component is deeper and almost extends the entire depth of my Salamander Archetype 5.0 rack. Not a big deal in most cases but I could see this being problematic for desktop use. Despite the unusual depth, this is still a visually striking component that looks very nice mixed in with my other gear. A weight of over 10 pounds lets you know NuPrime isn't messing around on build quality.



The next thing that caught my eye was the interesting front panel design. All angular and industrial looking, it certainly looks different from most anything else that's come through my audio rack lately. And yet, I notice the old NuForce DAC-9, which I didn't really care for in terms of sound quality, had a lot of visual similarities. Unlike that model with its rather obvious LCD display, the DAC-10H has discrete LED "dots" which show input selection, volume, incoming sample rate, etc. When the unit is off you can hardly tell there's anything there. In this respect the design is reminiscent of the "Home" series I reviewed a while back. I think it's quite handsome overall, unique but not outlandish, and suitable to match with gear from other brands (though I'm sure NuPrime would prefer we use their own matching products).

One potentially polarizing aspect of the DAC-10H is the array of buttons spanning the front panel. Where the Home series models were all about minimalism—just one multi-function knob and four buttons for input

selection—this new design has a discrete button for everything. This is both aesthetically busy and less intuitive to the touch. And yet, with so many features on board, I can't necessarily think of a better way to handle all the necessary controls. Still, I often find myself not quite sure which button I'm looking for—some differentiation in shape or feel between buttons might help, but then it might also throw off the clean look. Also, the included remote is a bit...unusual looking. It took me some time to get accustomed to the layout. After a day or two I had it mastered so we aren't talking rocket science.

Prior DACs from NuForce didn't seem to follow any particular script in terms of chip selection. Their DAC-9 used dual-mono Burr Brown PCM1798 DAC chips, while the DAC-100 came out of left field with the somewhat rare AKM AK4390. NuPrime goes what I'd call a bit more mainstream with their choice of a top ESS Sabre DAC paired with an XMOS asynchronous USB input. This is a popular combo, and for good reason—the ESS DACs are found in some VERY high-end designs, while the XMOS chipset is probably the most reliable USB solution I've encountered. It's got very mature drivers making for a hassle-free experience. And it allows the DAC-10H to accept signals as high as 384kHz for PCM or quad rate for DSD, aka DSD256. Not that you'll find much in the way of material recorded in those lofty formats, but it's nice to have all the bases covered for future-proofing.

One possible discrepancy I spotted: [NuPrime's literature](#) mentions the ES9018 chip being used. When I see that, I take it to mean the original ES9018S which is an 8-channel DAC typically summed to quad-mono (or four DACs per channel if that makes sense). But I checked under the hood and discovered the chip actually in play is the ES9018K2M. This is a newer chip designed for two channel applications and using a smaller, more power efficient form factor. Dynamic range is a step down but still excellent at 127dB, while the ES9018S hits 133dB which is indeed the number listed in the DAC-10H description. I just assume this is caused by the marketing and design teams not being on the same page. After all, the ES9018K2M is a newer chip which is showing up rather often in newer DACs, while the ES9018S seems less commonly used. Not that it likely makes a huge difference either way.



Did I mention the plethora of input and output options? On the input side, we get USB, two Toslink, two coaxial, and a pair of analog RCA inputs. For outputs, the previously mentioned balanced and single-ended headphone outs, plus RCA and XLR outputs to feed an external amp. In total, this is a more robust feature set than most other DACs I've encountered—especially those using this same half-width format. NuPrime wanted to accommodate all users, even those with complex systems—got a turntable or maybe an AM/FM tuner? Cable box, game console, and various other boxes with digital outs? No problem, it should all fit just fine. Most modern DACs play the preamp card just because they have volume control, but most don't have enough inputs to support anything more than a basic setup.

Speaking of preamp duties: among the most interesting aspects of the device is the volume control. Where many DACs in this price class rely on the (lossy) digital volume control implementation built into the DAC chip itself, NuPrime takes their own route by using a switched resistor ladder network borrowed from their expensive P-20 preamp. At the heart of this volume control scheme is the Muses 72320 chip from New Japan Radio Co as also found in the \$16k Pass Labs XP-30. The result is just a single resistor in the signal path at any given volume, throughout a range of 99 steps in .5dB increments. Output can go as high as 8V on the XLR or 4V on RCA making this a true preamp in every sense of the word. Analog inputs do not require digitization as they would in other designs that lack analog volume control. Four different gain setting allow for ideal system matching. In short, NuPrime has all the required bases covered for use in most any situation.

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## COMMENTS



### Mr. Grandberg & a TRUMP'd Tyll,

Submitted by tony on July 28, 2015 - 4:41pm

In the interest of filling the dead air between Tyll's reports:

I'll report that MSB is showing-off their latest DAC at my local High-End Audio Salon.

( hmm, we still have some of those although they seem part-time sorts of places ).

Anyway \$90,000 buys you one, you'll need their matching player, add \$10-15,000!

Transparent Cables? ( certainly not Monoprice or Audioquest ) add another \$10,000+

So, is our Tyll TRUMP'd?

Are there any superlatives left for gear this pricy?

MSB stuff makes Tyll's test seem like some guy looking at the Cheap stuff.

The money for one MSB rig buys every single "top" item Tyll has on his Montana test bench. phew!

Can you put this into perspective for all us Chevy buyers?

Tony in Michigan

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### Perspective

Submitted by John Grandberg on July 29, 2015 - 11:44pm

The way I see it, lot of these companies just make the crazy expensive models to bring more prestige to the name, thus helping sell more of the low or mid range stuff.

Think Bel Canto Black for over \$50k, when Bel Canto mainly sells gear in the \$1k to \$4k range.



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DAC REVIEWS

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I'll cut to the chase and say the DAC-10H is a very fine DAC. It's neutral, clean, and highly detailed, presenting a clear window into the music as only the best DACs can. While not having "smooth highs" in the manner of some NOS DACs or tube-based designs, the DAC-10H does indeed sound "smooth" in the sense that it doesn't have a trace of digital glare. Poor recordings still sound, well, poor...if you primarily listen to lower quality material—and I don't mean that in an insulting way, as lots of great music fits this description—you should probably look for a more colored, forgiving source. But rest assured, if there's no artificial glare in the recording, the NuPrime won't add any of its own.

I happily used the DAC-10H in a variety of systems, with my best amps and headphones of both the dynamic and electrostatic variety. I also gave it a workout with some fairly serious speaker-based gear—from the \$550 [Adam Audio F5 monitors](#) to the Sonus Faber Venere 1.5 (\$1,600 with matching stands) driven by Merrill Audio monoblocks, and finally culminating in the best speakers I've heard in ages: the JansZen zA2.1A-HP. These \$15k beasts are about as resolving as it gets, and the NuPrime never faltered despite the price discrepancy. I especially appreciated the well-done preamp section with precision volume control. Adding an external preamp seems totally unnecessary in my opinion, unless one desires some type of specific coloration (hello, tube rolling!). Contrast that with my far more expensive Calyx Femto DAC which uses the standard ESS Sabre volume control—it does a respectable job, especially at high levels with just a small amount of attenuation (up to about -20dB or so). But using it for low volume listening really flattens out the soundstage and just sucks the life out of the performance. Adding even a modest dedicated preamp for volume duty brings things back up to where they should be, which tells me the Femto is not really suited to drive power amps or active speakers directly. Score one for NuPrime for coming through on this oft-undelivered aspect.

Sonically, the \$7,000 Calyx teased out a bit more micro-detail, with increased air on the top end resulting in superior imaging. It's among the best I've heard in this area. I noticed this especially with speaker listening, where the opportunity for an enveloping presentation is inherently greater. But the difference certainly doesn't justify the \$5k+ price difference. And the NuPrime avoids the somewhat dry, thin midrange presentation that I hear from the Calyx, which keeps the more expensive model from being among my favorite DACs. The DAC-10H has a more liquid presentation which makes vocals more vivid, snare drums more snappy, and piano strikes more palpable. Thus I'd say the NuPrime is not necessarily better, nor worse, just different—but clearly far superior in terms of value.

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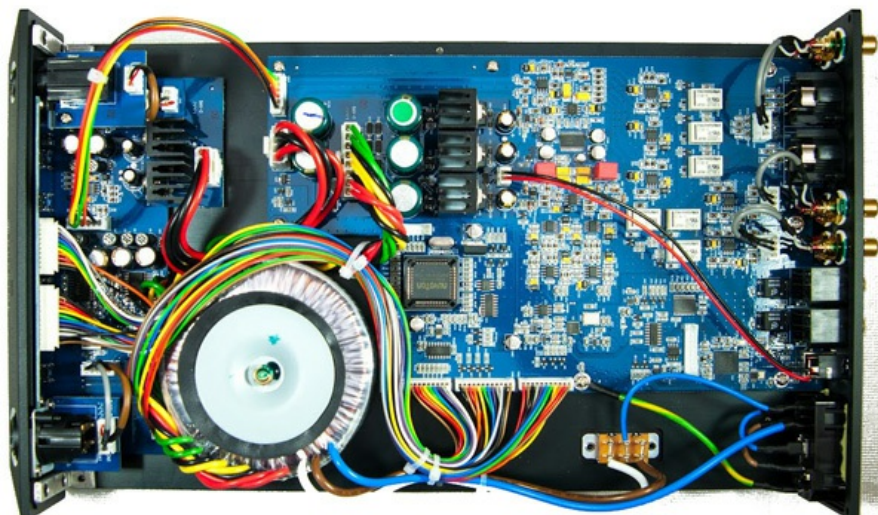
I could talk about the DAC and preamp capabilities of the DAC-10H all day—they're that good. But what I really want to focus on most is the headphone amplifier. It's really something special. Sure, lots of DACs have some type of headphone output on board, but many of them are little more than an afterthought. NuPrime's is the real deal—fully balanced design, with gobs of power, all routed through that sweet lossless volume control system. This headphone stage was clearly taken very seriously.

Maximum output is 4,000mW per channel into 32 ohm loads via the balanced output. It will do 3,200mW into 50 ohms and 1,600mW into 100 ohms, meaning every variety of planar magnetic headphone should theoretically be well served. And that's exactly how it played out in my testing. The notoriously difficult HiFiMAN HE-6, at just over 50 ohms, sounded better than I've ever heard from an integrated amp section. It didn't have that thin, bright character which comes from a lack of current. Low frequency performance was strong too, with excellent bass rumble and deep extension. I have heard the HE-6 sound better, but not without adding an expensive outboard amp. Other models from HiFiMAN and Audeze sounded great as well—I particularly enjoyed the LCD-2 Fazor which has a more refined, detail-oriented sound than its predecessors. The amp stage of the DAC-10H seems to focus more on dynamics than micro-detail, so pairing it with the smoother first gen LCD-2 models may be too much of a good thing. HiFiMAN's new HE-1000 flagship has impressive highs and also sounds quite good from the DAC-10H. That probably makes for my favorite combo of all, though I recognize the price discrepancy is fairly extreme. Folks running a \$3k headphone would almost certainly own a dedicated high-end headphone amp. Still, it's nice to hear what the NuPrime is capable of.

Moving away from planar headphone designs, I brought out a variety of dynamic options. High impedance models like HD800 and T1 had plenty of drive—my ears gave out long before maximum volume was achieved. The slightly smoothed top-end of the amp made a great match for these particular cans, both of which can sometimes be considered overly bright. Again the focus was more on a weighty, dynamic presentation than it was on detail retrieval. Subtle nuances were by no means glossed over—they just weren't as prominent as I've heard with some other amps. Whether this is a good thing or not will depend on the taste of each individual user. Note that I used the T1 only from the single ended jack, while all the other listening I've mentioned thus far was balanced. I do think the balanced option sounds superior and recommend using it whenever possible. The 1/4" jack is perfectly acceptable but in comparison sounds a little soft and "boxed in" for lack of a better term.

Low impedance, sensitive headphones were generally not a problem. The single-ended jack has an output impedance of 4.7 ohms, while the balanced out is double that. That's just high enough to potentially cause minor trouble at times—my Grado PS-500 seemed very slightly "off" in the midbass region, to use one example. Not nearly enough to ruin the experience, and honestly not really enough for me to even have a clear grasp of what seemed wrong. I doubt I'd even notice this had I not been spending a lot of time with this particular headphone on various other amps. I do think I'd have a bigger concern if my Grados were balanced though, as that would cause more significant issues with damping factor. In terms of sound signature I found the smooth top end to pair very well with Grado, Audio Technica, and AKG headphones in general. As with HD800 and T1, not everyone is looking for this type of "musical" presentation, and detail junkies may not be quite satisfied here. For me, it worked out very well with most music.

Another aspect worth mentioning is that even very sensitive headphones played well with this powerhouse amp. My AKG K812 is a good tool for tracking down hiss in amps, and in this case it showed none. I also appreciated having a very wide range of volume control with this sensitive headphone—I've encountered amps with too much gain, meaning the K812 got too loud, too fast. Even IEMs worked rather well—potential output impedance issues aside—with volume settings ranging from 1 to about 30 before it got too loud. That might not sound like a lot, yet I don't recall running into a situation where I found myself in need of an intermediate volume step. And remember we aren't throwing away bits at these very low volumes, as would be the case with most digital attenuation schemes. So, again with some caveats about output impedance, the amp section really does work with every type of headphone, just as NuPrime claims.



Opening the case for a closer look at the design, I found the DAC-10H headphone stage to be relatively simple yet also somewhat mysterious. Signals obviously come in from the preamp section with power coming in from the robust linear power supply on board. The headphone amplification stage is based around three relatively large chips which have custom NuPrime markings and are thus not identifiable by me. They don't appear to be any of the usual suspects like the TPA6120A2 or the LME49600. The amount of power on tap suggests a chip amp of the type normally enjoyed by the DIY speaker amp community. That's not an unprecedented move—Lake People uses a chip amp design for their [G103 amp](#) and it works rather well. I don't see the typical heatsink aspect here but perhaps the relatively low output mitigates that requirement. For their part, NuPrime will only tell me it is a rebrand of some existing chip, and their entire circuit is designed around its requirements. Fair enough. Since the DAC is a fully balanced affair, the 1/4" headphone out uses an OP2134 opamp to generate a single-ended signal which then feeds into a single mystery chip. The balanced out gets two of the same mystery chips which explains its doubling of both current and output impedance.

Bottom line—the amp section is satisfying to the point where it feels like a quality stand-alone amp rather than a mere add-on. It's so good that I believe NuPrime could release a dedicated headphone amp based on the same design and be quite successful. No sooner did I have that thought than I discovered NuPrime actually does have just such a device in the works, tentatively scheduled for an October release. If they can keep the price reasonable and perhaps lower the output impedance a bit, it could really be something.

NuPrime also sells a version of this device sans headphone amp, called the DAC-10. It goes for \$1,495 which is \$300 less than the DAC-10H. I have yet to hear a headphone amp costing \$300 that sounds this good, not to mention packing this much power or being a fully balanced design. The previously mentioned Lake People G103 doesn't match it, nor does the [NuForce HA-200](#) (\$349) I covered last year. Therefore it seems reasonable to recommend the version with the integrated amp as the better value, considering what you get for the money. Even if one mainly uses speakers at the moment, there may come a time when headphones enter the picture...if/when that happens, won't it be nice to have a very solid headphone amp already available?

**CONCLUSION** There's certainly no shortage of quality DACs in the popular \$1,000 to \$2,000 price range. So how does the NuPrime DAC-10H stand out from the crowd? Let's recap: as a DAC, it equals anything I've heard in its class. Add in the exceptional preamp stage, the cutting edge format support, the very generous connectivity, and of course that killer balanced headphone amp, and it seems NuPrime is ahead of the game. There's really not much it can't do. If you find yourself in the market for new DAC, NuPrime's DAC-10H is worthy of very serious consideration.

