Furutech Alpha Design Labs GT40 DAC and Headphone Amplifier

01 May 11 Written by S. Andrea Sundaram

With the explosive growth of computer-based music systems, external digital-to-analog converters (DACs) have again become all the rage. Of particular interest are those that can connect directly to a computer via USB or FireWire. Direct connection is not only convenient and saves the expense of an extra component, it also has the potential sonic benefits that result from eliminating the many problems of the S/PDIF protocol. It baffles me why some of these USB DACs -- even very expensive ones -- still support sample rates up to only 48kHz. That completely negates the primary sonic advantage of a computer-based system: the ability to play music at resolutions higher than that possible from CDs. The Furutech GT40 is not only a 24-bit/96kHz-capable USB DAC and headphone amplifier, it also incorporates a moving-magnet (MM) and moving-coil (MC) phono stage and an A/D converter, with which you can record your LPs at 24/96 -- all for the very reasonable price of $480 USD. And if the GT40 can perform all of these functions *well*, then it must be counted a veritable bargain.

Furutech, a Japanese company, has been around since 1988. Most audiophiles are familiar with their well-regarded power products -- wall sockets, AC cords and filters, line conditioners, etc. -- and their extensive line of interconnects and various audio connectors, but the GT40 is Furutech's first bona-fide audio component. That fact notwithstanding, from the moment I extracted the GT40 from its shipping carton, I could see that I was dealing with not a prototype but a finished product.

With all of the GT40's features, it's important to be clear about what it does and does not do -- and neither the manual nor Furutech's website is very helpful. The GT40 is a DAC with a single digital input: USB. It is compatible with both Windows and Apple operating systems, and probably with at least some flavors of Linux (though Furutech makes no such claims). It supports bit depths of 16 and 24 and sample rates of 32, 44.1, 48, and 96kHz, though not 88.2kHz. A 88.2kHz file will therefore need to be converted to 96 or 44.1kHz. The GT40 is also a full-fledged headphone amplifier that works with both the USB DAC and the line/phono input. It also can be used as a minimalist preamplifier that permits switching between two sources -- its internal DAC and one analog connection -- and manipulation of the volume using the same knob as for the headphone output. There is no provision for making the line output a fixed voltage -- it's always controlled by the volume knob.

Although the GT40 provides no gain for line-level sources, there does appear to be some active circuitry in the signal path before the output. Nor does it mute the line output when you plug in a pair of headphones; you'll have to turn off your amplifier if you want to do some private listening.
The GT40's standout features are that its single analog input can be switched between line level, MM, or MC, and that the chip used for D/A conversion can also be used for A/D conversion, allowing you to make 24/96 recordings of any analog source, whether phono or line level.
The GT40 is a well-built, handsome-looking component that wouldn't embarrass itself if it cost two to four times as much. It measures a fairly compact 5.9"W x 2.2"H x 4.3"D and weighs a solid 1.7 pounds. The chassis is constructed entirely of aluminum with a 0.25"-thick faceplate, and is supported by four sturdy rubber feet. On the front panel are the silky-smooth, machined volume knob; a single headphone jack; and two comfortable pushbuttons: Power glows blue when the device is on, and the Source Selection switch glows green for USB, red for Phono/Line. There are no lights to indicate the sample rate, or whether the GT40 has locked on to a digital signal. On the rear panel are two pairs of high-quality, chassis-mounted RCA jacks -- one each for input and output -- a switch for selecting among MM, MC, and Line; and a grounding post, a USB connection, and the input for a 9V wall wart (included).
The Furutech comes in a cardboard box with a printed informational sleeve. Included are a USB cable and a minimally informative user's manual in Japanese and English. The manual gives specifications and a very little bit of help in setting up the GT40 to work with your computer. There is no software or driver CD, and none should be required.
The GT40's input sensitivity is stated as 0.5mV for MC, 5mV for MM, and 1V for line-level sources. That equates to a gain of 46dB for MM and 66dB for MC, which should be adequate for all but the most esoteric cartridges. There are no adjustments for resistive or capacitive cartridge loading, but that's hardly unusual at this price, and I'm not one to complain about such things -- my Shure V-15X MM cartridge has no fancy requirements. The line output has a maximum value of 1V, which in most cases would be sufficient for a source but is too low for a preamplifier. If you're using the GT40 with, for instance, a 100W power amplifier that requires 2V for full output, then you've turned the latter into a 25W amp. When I asked Furutech about this low output voltage, they said that they hadn't intended the GT40 to be used as a preamp, but in conjunction *with* a preamp. On the other hand, having the line output connected to the volume control clearly suggests running the GT40 directly into a power amp or into a pair of active speakers -- either one of which could have an input sensitivity higher than 1V.
The headphone jack has a maximum output of 80mW and a claimed maximum impedance of 32 ohms. I wonder if they meant to say *minimum* impedance, because high-impedance headphones are actually easier to drive -- *i.e.*, require less current for a given voltage -- than low-impedance headphones. During the course of the review I used the GT40 with a number of headphones, including the Sennheiser HD 600, which has a nominal impedance of 300 ohms, and experienced no real problems in driving any of them. I did feel, however, that the GT40 pushed the HD 600s' frequency response a little toward brightness. That doesn't have anything to do with these headphones' nominally high impedance, but with the fact that its impedance curve is not flat.

Setup

Setting up the Furutech GT40 to work with my computer couldn't have been easier. I simply plugged it into the wall, then connected it to my computer with the included USB cable. Windows Vista recognized it immediately and proceeded to install the driver without any action on my part. It took all of 30 seconds. (Connecting it to a machine running Windows XP proved similarly painless.) At that point you could be done, but a few tweaks will lead to better performance. My computer identified the device as "ADL GT40 USB DAC" and made it my default output device. In my audio settings, I returned my computer's soundcard to its status as the default device so that random computer sounds wouldn't interrupt my listening. I generally listen to music from my computer using foobar2000. By using the kernel streaming plug-in and selecting "KS ADL GT40" in the output settings, I ensured that the audio datastream was being sent to the GT40 without the computer performing any calculations on it. Kernel streaming also ensures that the output sample rate changes with the sample rate of the file. In the beginning, I used the GT40 to listen only to computer-served files via headphones, so no other setup was required. Later, I used the Furutech in a variety of system contexts, but none of these required anything more than swapping out cables and flipping the switch on the rear panel to move to phono operation.

I encountered two minor hiccups during my time with the GT40. Occasionally, the output would mute for a second, then pick back up. That behavior isn't uncommon with USB audio devices, and entire listening sessions passed without it happening once. Other days, it could happen two or three times in the space of a single album. My computer isn't dedicated to audio duties, and there are always other programs running in the background, which could be part of the problem. Strangely, I wasn't able to force the sound to drop out, no matter how hard I tried to run the system while playing music. A USB DAC that employs some sort of buffer system may be completely immune to such interruptions. Turning the GT40 on or off, I heard a slight *pop* in the headphones and the line out. Again, that's not at all uncommon, but you should be aware of the potential for speaker damage when deciding in what order to power up and down your components -- I recommend turning on the GT40 before your power amp, and turning it off after.

As a DAC

The first thing I did after turning the GT40 on and letting it warm up was to listen to it with no signal present. Many headphone amplifiers, even some very expensive models, have some audible hiss or hum even with the volume set to zero. There was none of that with the GT40. After checking to make sure the input selector was set to Line rather than either of the phono options, I turned the volume knob to its maximum. I heard a substantial amount of hiss, but at reasonable to moderately unreasonable volume levels the GT40 was silent enough that I never noticed anything between tracks. Even with in-ear monitors, the Furutech was quiet. I can't say the same about any iPod I've ever heard, or my HeadRoom Total BitHead.

I did a similar test using the GT40's line-level output into the input of my Grace Design m902 headphone amplifier -- which is, itself, silent. At its maximum volume, equivalent to 1V output, the GT40 produced an appreciable amount of noise. Again, I couldn't hear this noise at normal listening levels -- but if you intend to use the GT40 as a source into a preamplifier or integrated amplifier, you'll want to turn that component's volume knob all the way up, then use the GT40 to adjust the listening level.

The sound of a DAC is always heavily dependent on the analog circuitry that immediately follows it, and the sound of other components further along in the signal chain can also have a strong influence. The sound of the GT40's DAC, therefore, depended on whether I was using it as a headphone amp or as a source. The overall timbral balance through headphones was on the warm side of neutral -- which is not at all a bad thing. The top octave was a little restrained, but I would hesitate to go so far as to call it "rolled off." The bass response was slightly soft, in terms of both level and a slight rounding-off of each note's attack. The combination of these characteristics focused my attention on the midrange. Fortunately, that's where the GT40's headphone amp excelled. It was rich and lush, but not too much so, which worked well with voices, male or female. I found a particular synergy when using the GT40's headphone amp to drive the Grado SR60 'phones, which themselves are limited in the frequency extremes, but have an exceptionally nice-sounding midrange for the price.

To evaluate the GT40's line-level output, I connected it to the line in of my Grace m902 with the Grace's volume control set to 95. In this configuration, the GT40 sounded a little less warm and a little more even across the audioband. The highs were slightly more extended than on the headphone side, but still not perfectly flat out to infinity. A slight prominence was given to the midrange, though not quite as much or as sweet-sounding as through the headphone-amp section. Bass extension was better, as was its articulation, but it still could not quite plumb the absolute depths. The Ultrasone Edition 8 headphones showed me the GT40's bass limitations, but they are exceptional performers in this regard, and cost $1500. Using the Grace as the headphone amp, the GT40's DAC was able to wring all of the bass possible from the Sennheiser HD 600s, and nearly so from the Ultrasone Pro 2500 'phones. If you plan to use the GT40 as a source to drive a system with loudspeakers, the Furutech's absence of profound bass should be a concern only if you're using very large and capable floorstanders.

I like the sound of my disc player slightly better than that of my computer-based system, so I haven't made the effort to rip many CDs to my hard drive. Consequently, most of my computer listening is to 24/96 files that I've downloaded. (In most cases I eventually get around to burning them to DVD-Audio to take advantage of the excellent DAC in the Ayre C-5xe^{MP}. There's nothing inherently better about playing discs vs. computer files -- it's possibly the other way around -- but given the components I own, that's the way it goes.) Unlike many USB DACs, the Furutech GT40 can play most of my files at their native sample rates. I don't have many 88.2kHz files, and most of those have been downsampled from DSD, which always sounds significantly better when played from the original SACD. The few 192kHz files I have don't suffer all that much from being downsampled to 96kHz.

For those cases in which I'd ripped a file at 16/44.1 from a CD to compare directly with the high-resolution download, the GT40 made the difference obvious. The difference wasn't so much in frequency extension or harmonic texture, as I'm accustomed to hearing with more expensive components, but in the greater solidity of the instruments and voices and a better sense of timing. The GT40's somewhat warm sound helped to mitigate the grain present in all 44.1kHz recordings, but listening to them at 96kHz eliminated it entirely -- which is why a modern DAC must be able to support sample rates at least that high. What's more, it needs to make the difference plain; you shouldn't need a light on the front panel to tell you that you're listening to a hi-rez recording. The Furutech GT40 won on both accounts.

I had two other computer-ready DACs with which to compare the GT40. My original version of the HeadRoom Total BitHead sold for $279 when still available. The current version sells for only $159, and I've heard that it's better than the original, partly because it incorporates a selectable gain switch. There are, of course, differences other than price. Unlike the GT40, the BitHead is small enough to be portable, and can run on batteries or directly from USB power. The BitHead supports bit depths only up to 16 and sample rates of 44.1 and 48kHz. On purely sonic grounds, and comparing CD-quality files, the GT40 was superior in every way -- as it should be for three times the price. The BitHead produces hiss at all volume levels, no matter what headphones I use with it. This hiss is only slightly annoying with large, inefficient 'phones, but it makes the BitHead practically unusable with in-ear monitors. The BitHead is also much more curtailed at both ends of the audioband, and has a prominent midbass hump. While that makes it tolerant of poor connected equipment and recordings -- which was probably the idea -- it sacrifices a lot of musical information.

My Grace Design m902 retails for $1695 -- more than three times the GT40's price. One could argue about which component is richer in features. The m902 has more inputs, both analog and digital, as well as adjustable balance and a cross-feed circuit. The GT40 counters with its built-in phono preamp and ADC. The m902's DAC supports 24/192, but not through its USB input, which is capable only of 44.1 and 48kHz sample rates -- if you want to take advantage of hi-rez playback, you'll need a USB-to-S/PDIF converter. Even when I listen to music at those lower sample rates, the Grace's USB connection sounds a bit muddy. My laptop has a coaxial digital output that supports sample rates of up to 192 but not 88.2 or 176.4kHz, so I can't natively play files at those 44.1kHz multiples, even though the m902's DAC would support them

The sound of the m902 is cleaner than that of the GT40, as befits its higher price, and its frequency response extends to the deepest bass and the highest treble. The m902 does an excellent job of conveying the timbres of voices and instruments, and reproduces a tremendous amount of detail. Soundstaging is often not regarded as being very important with headphones, but with well-recorded music the Ultrasone models I typically use are capable of reproducing some sense of space and the relationships among instruments. (I'm not talking about using a cross-feed circuit, which can give a very limited sense of space with typical headphones.) The GT40 did a good job of creating a soundstage from left to right, but it couldn't create much sense of depth. The m902 goes a little farther and a little more precisely from left to right, and does an excellent job of conveying an illusion of depth. This difference was certainly noticeable with headphones, but would be even more important when comparing these components for use as a source/preamplifier. The question is less about to what degree the Grace m902 outperforms the Furutech GT40, and more about whether the differences are likely to be heard through the partnering equipment, and how much you might be willing to pay for them.

As an ADC

I first evaluated the sound of the GT40's phono section on its own. Using the MM gain setting, hiss from the phono preamplifier was lower in level than the surface noise on most LPs, and only slightly noticeable with the highest-quality pressings. The MC gain setting is quite a bit noisier, and would definitely interfere with listening enjoyment. I can't imagine anyone having a low-output MC cartridge but *not* a competent phono stage; it's not clear why Furutech has included this option. Returning to the MM stage, the frequency response was restricted at both ends of the audioband, and imaging was a bit flat -- think fluffy pancake rather than crêpe. Overall, it was probably at least as good as the phono sections provided with most receivers or integrated amplifiers -- when one is provided at all. I did compare the GT40 to a $20 phono preamplifier I had lying about, and found the Furutech vastly superior. It's convenient to need no additional components when digitizing your LPs, but if you have a good outboard phono preamp, you'll probably want to use it with the GT40 switched to Line.

Furutech provides no software with the GT40, nor any suggestions of what programs to use to digitize your vinyl. A simple Internet search reveals countless options, from basic sound editors to dedicated applications that include click-and-pop removers and cataloguing functions. Since I occasionally do recording projects, I own and am familiar with Ableton Live 6, which supports just about any hardware at any sample rate (provided you configure it correctly), so that's what I used. To not limit the test of the GT40's A/D conversion to the quality of its built-in phono stage, I connected my own Trigon Vanguard II with Volcano power supply.

The digitized files were suitable for casual listening, but not so good as to make me want to move my records and turntable into storage. Inserted between me and the recordings was a slight layer of electronic haze that dulled instrumental timbres, made performers seem farther away, and robbed soundstages of whatever depth they had. The same problems were apparent when using the GT40's phono stage, though to a lesser degree. Recordings that I've made with my Harman/Kardon CD recorder don't insert that layer of grime or flatten the soundstage quite as much. On the other hand, the GT40 didn't truncate the highs, as does the H/K and any other 44.1kHz ADC.

Conclusions

When reviewing a lesser-priced component, reviewers accustomed to listening to very high-quality, expensive audio equipment often fall into one of two traps: either they disparage it for not being as good as products that aren't really its competitors, or they're so amazed that it doesn't sound awful that they heap on it undeserved praise. When I review such a component, I endeavor to describe its performance in ultimate terms, then put that performance in perspective relative to the component's price class. Considering only the output side, what flaws I found in the GT40's sound were exclusively things that it didn't do as well as higher-priced competitors. Furthermore, those limitations were apparent only when I partnered it with highly revealing auxiliaries. Within a more likely context, the GT40 need make no excuses for its performance.

Other DAC/headphone amplifiers at about the GT40's price support 24/96 files, but very few of them can also be used purely as a headphone amplifier -- and none, as far as I know, has a built-in phono stage. If you're content to buy a GT40 for those features alone, $480 is not an unreasonable price for this level of performance. Of course, the GT40 also includes an ADC, which makes it a one-box solution for converting the output of your turntable into digital files.
If you're looking for a high-quality way to get high-quality sound out of your computer and want to digitize the occasional LP, then the Furutech GT40 is a really good choice.
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Warranty: One year parts and labor.
Associated Equipment
Headphone amplifier -- Grace Design m902, HeadRoom Total BitHead
Headphones -- Ultrasone Pro 2500 and Edition 8, Sennheiser HD 600, Grado SR 60
Digital source -- Ayre C-5xe^{MP} universal stereo disc player, Apple iPod (fifth generation)
Computer -- Laptop running Windows Vista and Realtek HD audio ALC 272 with coaxial digital output running foobar2000
Analog source -- Michell Tecnodec, HR power supply, modified Rega RB-300 tonearm, Shure V15-X MM cartridge into Trigon Audio Vanguard II with Volcano power supply
Interconnects -- DH Labs Revelation, QED Silver Spiral, JPS Superconductor
Power conditioning -- Equi=Tech Son of Q

http://tinyurl.com/65hdcw5