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## AURENDER FLOW DAC/HEADPHONE AMP

### Desktop Delight

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Categories: [Digital-to-analog converters](#)

Products: [Aurender Flow](#)



When I first laid eyes on the Aurender Flow, I didn't get it. Taken from its form-fitting leather case it looked like another portable player, albeit big and sorta on the heavy side. It also looked 90s-ish with a big ol' center knob, a wiggly curve to its chassis resembling a logo for a hydro-spa, and one lone single-ended headphone output. Paging Forrest Gump: We got your portable player, right here. But I was completely wrong.

First, let me make one thing perfectly clear, the Aurender Flow is not a portable player. It is, in fact, a DAC and headphone amplifier capable of being used as a preamplifier and external drive (if a drive is installed in it), that makes it ideally suited for nearfield high-performance desktop use.

That large knob I mocked earlier...well, its size and feel make it one of the most accommodating volume knobs I've ever had the occasion to fondle while hunting for that ideal SPL.

### **Tech Tour**

With its footprint measuring only 5½" by 3½" by 1", Aurender packs a lot of technology into the Flow's one-pound chassis. The DAC uses an XMOS USB interface and Sabre ESS9018K2M chips, and has its own internal 4450mAh battery power supply. The Flow can handle any digital data stream up to 384/32 PCM and 128x DSD via USB and 192/24 PCM via its TosLink input. Although the Flow has only a single-ended ¼" 'phone-jack output, it can be configured in several ways. It can be variable output in 0.5dB increments up to 2 volts or you can configure the Flow for fixed output at either 2 or 5 volts. No, that was not a typo—5 volts. Output impedance is only 0.06 ohms.

The first time I saw the Flow I was confused by its m-SATA drive capability. You can add a drive to the Flow, and most people would assume it is for storing music to be played on it. They would be correct, but unlike a portable player where you could access the drive on the go, the Flow's drive can only be used when it is connected to a computer. But using an Apple camera connection cable, one can also access the contents of an iPad or iPhone.

In function, this is similar to the Auralic 2000 DAC/headphone stand that I reviewed in Issue 246. It, too, had provisions for tethering a drive that could only be accessed while the Auralic was connected to a computer. The difference is that the Flow holds the drive internally while the Auralic uses external drives.

The Flow is the first USB DAC I've seen that is USB 3.0-compatible. If your computer only supports USB 2.0, no worries, the Flow has provisions within its menu for several different "host modes" optimized for various computer systems. The options include USB2, USB3, Mac, IOS, and Android.

The Flow also has user-selectable digital filters. For PCM it has, by default, a PCM1 filter (which is a slow roll-off, in-band filter), and a PCM2 (which is a minimum-phase PCM filter). DSD users have the option of moving the DSD cut-off filter from the default, DSD at 47.7kHz, to 50, 60, or even 70kHz. There are three charging options: CHG+ is constant charging mode; CHG- turns off the charger; and CHGA- configures the Flow for automatic charging whenever music is not playing.

### **Setup and Ergonomics**

Unless you intend always to use the Flow as a fixed-output device, its ideal location should be somewhere within arm's reach. Heck, even if you never intend to use its volume control, the Flow is much easier to operate when it's close to you, so you can see its display. Yes, the Flow has a display in the circular area inside its volume knob. Given the small area of this display, it is remarkably complete. Not only can you see the current volume level but also the USB mode, the current format being played, the battery condition, the output mode, and even whether a headphone is connected.

The Flow can be placed so it lays flat on its back (there are four small rubber bumpers to protect its rear surface), or you can lay it on its side so the control buttons are all located on the top. The

only controls in addition to the large circular volume knob are along one side of the Flow. They consist of a power on/off, menu, move up, move down, and play buttons. The menu button has two modes, one for commonly changed settings and another push-and-hold mode for the settings that you will only need to alter occasionally.

Upon initial installation you are supposed to designate which kind of computer or smartphone the Flow will be connected to via the push-and-hold menu button. But if you're the kind of person who doesn't read the owner's manual cover-to-cover and assumes that if you're using a Mac, the Flow will be plug-and-play, the Flow *will* work, although I found performance to be better if you do set it up optimally for the device it is going to be tethered to. On a Mac, once designated, I found that the play, pause, move forward, and move backward buttons will operate iTunes as well as Aurdirvana+, Pure Vinyl, Pure Music, and Amarra Symphony. Keyboard and mouse controls also remained fully operable with all these apps.

The review sample of the Flow came with a 250GB mSATA drive mounted in it (it is sold *sans* drive, which is easily user-installable). My MacPro recognized the drive immediately and mounted it on the desktop. As with any mounted desktop drive, if you remove the drive without first unmounting (or ejecting) it, you will get an error message, and if you turn off or disconnect the Flow you get that same error message. This error warning gets old. Because a 250GB drive was too small for my entire music library (the Flow holds up to a 1TB mSATA drive) and I didn't need another set of back-ups, I turned the drive off via Flow's menu—after ascertaining that it could be written to and read from successfully.

Manufacturers of battery-powered devices will always face the dilemma of figuring out how and when they should be recharged. The Flow gives you the three options that I noted earlier. For optimal sound, I recommend turning off the recharging completely. When used as a preamp I could hear some low-level noise generated by the Flow's charging circuits even in the "charge only when not playing" mode. When attached to an analog preamplifier the noise levels were the lowest in fixed-output mode with charging turned off.

I used the Flow with a wide variety of earphones from highly sensitive in-ear monitors to my least efficient full-sized headphones, and I was pleasantly surprised that they all worked well. Even with the most sensitive Westone ES-5 there was only the very faintest bit of low-level hiss. At the other end of the efficiency spectrum, the Flow had more than enough power to drive Beyer Dynamic DT-990 600-ohm version well past *loud*. The Flow is the first headphone amplifier I've experienced that didn't need multiple gain settings to successfully accommodate a full range of headphone options.

One feature I've never given much thought to (but will in the future) is how a headphone amplifier interfaces with a new headphone. When you unplug and then plug in a new headphone, an amplifier can handle the new headphone in several ways: The amplifier can merely reproduce the previous volume settings. Or it can mute the output until the volume level is adjusted by hand, at which point the previous volume level manifests itself. Or it can mute the output and then reset the volume to maximum attenuation. After being blasted by more than my fair share of headphones, I much prefer the last method. Especially with the Flow's 0.5dB volume increments, matching levels when comparing two headphones—even allowing for the opportunity to linger over that wicked-cool volume knob—was rapid and repeatable, and I never had to worry about lowering the volume before installing a different pair of cans. A further nice ergonomic touch is

that the Flow's display has an outer ring that shows you the volume level—when you remove a pair of earphones, you can watch the that volume ring drop, reassuringly, back to -90dB.

## Sound

In the short time it's been around, Aurender has already garnered a reputation for making excellent-sounding gear. The Flow should enhance its already sterling character. I used a wide variety of headphones with it and couldn't find a mismatch. Unlike some headphone amplifiers that favor a particular set of headphones or type of 'phone, the Flow was very much an equal opportunity amplifier; everything I threw at it worked fine and sounded good. Also, the Flow allowed each headphone to produce its own unique sound signature. Grado RS1s still presented a different soundstage and imaging characteristics than Mr. Speaker's Alpha Dogs.

Flow users have several PCM digital filter options that I mentioned earlier. Listening to Sia's "Chandelier" off Tidal, I liked the PCM2 filter better than the PCM1 default. PCM2 produced better decipherability of her phrase "can't feel anything" and more precise imaging on the background singers located hard left and hard right. Also in this mode, the intentionally added distortion bed was a hair less aggressive. In the past I've found that many PCM filters are more software than hardware dependent, and this was true with the Flow. Some music will benefit more from one PCM filter setting than another, so it's not a question of which filter is overall the "best," but rather, which one suits the music better. Too bad the Flow can't remember and employ whichever filter setting you find is preferable for a particular track, but as of now you still must change the filter settings manually via the menu.

I also used the Flow as a DAC/preamp by feeding its output to the analog input of the NuForce DAC-10H. Although it required using a ¼" headphone-to-female RCA adapter and then a 1 meter length of interconnect (I recommend something flexible such as the Kimber KCAG for this task), the setup worked nicely. I found the Flow's noise levels were lowest when I used the 2V fixed-output mode coupled with no battery charging. I used the NuForce ST-10 power amplifier tethered to a pair of Audience 1+1 speakers in my desktop system for these listening sessions. I also had a Velodyne DD10+ subwoofer tethered to the DAC-10H. I was impressed by how close the sound quality of the Flow was to the NuForce DAC-10H. Once levels were matched—which was pretty easy with the DAC-10H's numbered volume settings—the DAC-10H had a slightly wider soundstage, but the Flow's soundstage was deeper. The DAC-10H also had better low-level detail due to its somewhat quieter base noise level, but the Flow matched the DAC-10H's dynamics and pace.

I also compared the Flow with the Oppo HA-1, once more using the Oppo's analog inputs so I could compare the two in a matched-level A/B test. Again it was a close call with the Flow having better dimensionality and upper-midrange energy and the HA-1 having more relaxed transient response. The Flow produced a more three-dimensional soundstage, but the HA-1 produced better lateral delineation and separation between instruments in the soundstage.

Neither the Oppo HA-1 nor the NuForce DAC-10H could successfully handle as wide a range of different headphones as the Flow. Even with its different gain ranges, the NuForce DAC-10H could not go from high sensitivity to low with the same equanimity as the Flow. With the DAC-10H, you have to hunt and peck for the best combination of gain and volume; with the Flow, you

merely turn the volume knob to the right point. And while both the Oppo HA-1 and the NuForce DAC-10H offer far more flexibility in input and output options, if your primary use will be with headphones and not as a preamplifier for a speaker-based system, the Flow's feature set and sound make it a better option than the other two.

### Summary

I've heard there are some audiophiles who like an uncluttered desk. For someone who wants great sound, smooth ergonomics, and a compact footprint, the Aurender Flow offers an elegant solution for headphone and nearfield listening. Put a large mSATA hard drive in it and you have a clever rig for a traveling audiophile. Although the Flow will work in portable applications, in my view its one-pound weight and form factor make it more suitable for desktop service. Also, The Flow could easily find a place with music professionals, carrying it from studio to studio to ensure monitoring consistency.

Never before have audiophiles had so many fine options for DAC/preamps in the \$1000 to \$1500 range. I've mentioned several with which I'm familiar during this review. But the Flow's physical dimensions and its ability to drive everything I could throw at it headphone-wise make it special. Yes, my first impression of the Flow was wrong, but after giving it a chance to strut its stuff, I have to admit that it has become my current go-to headphone listening rig. If headphone listening from a computer source is your thing, you need to hear the Flow because it was made for you.

## SPECS & PRICING

**Sample rates:** Up to 192kHz via SPDIF; up to 384kHz, DSD128x via USB

**Compatible bit depths:** 16–24 (SPDIF), 16–32 (USB)

**Internal storage:** Up to 1TB total via mSATA bus

**Output impedance:** 0.06 ohm

**Output power (0.1 percent THD):** 43mW/600 ohms, 87mW/300 ohms, 384mW/56 ohms, 570mW/32 ohms

**THD+N:** –114dB

**THD (1kHz, 5.1V RMS output):** 0.0002 percent

**Dynamic range:** 122dB

**Damping factor:** >130

**Power supply:** 4450mAh Li-ion rechargeable battery

**Dimensions:** 3.1" x 5.4" x 1.1"

**Weight:** 1 lb.

**Price:** \$1295 without mSATA drive

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