

Review: Three amps for building your own desktop audio system

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Dayton Audio DTA-100a Class-T Digital Mini Amplifier



\$130.00

Audioengine N22 Premium Desktop Audio Amplifier



\$199.00



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Apr 17, 2013 5:00 AM |

I suspect a substantial number of people have an old pair of speakers sitting in storage: hand-me-downs from a family member, perhaps, or the remnants of a stereo of their youth. Such speakers can be repurposed to [build your own iPod stereo](#) or [AirPlay audio system](#), but they can also be used to put together a quality desktop stereo. (If you don't have an old set of speakers, there's a huge variety of unpowered speakers available that offer impressive performance, beauty, or value—or some combination of the three.) All that's required to get your old (or new) speakers making music is an audio source (an iPod, iOS device, [Apple TV](#), [Airport Express](#), Bluetooth audio receiver, old CD or DVD player, or computer) and an [integrated amplifier](#) or [stereo receiver](#).

Unlike [powered speakers](#) (such as computer speakers, powered monitors, and speaker docks), which have built-in amplification, passive speakers require [pre-amplification](#) to adjust the signal's volume to desired levels, and [power amplification](#) to further boost the signal so that it's strong enough to make the speakers move and produce sound.



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An *integrated* amplifier combines a pre-amp with an amp.

But while many people think of an amplifier as a big, bulky piece of hardware, these days it's easy to find integrated amplifiers that provide good sound while being small enough to fit on a desk or nightstand. I previously [reviewed several compact models with built-in digital-to-analog converters \(DACs\)](#)—these accept a digital signal rather than an analog one, processing that signal with higher-quality circuitry. But if your source's audio quality is “good enough” without an external DAC, or if the source offers only analog outputs, a traditional analog amplifier will suffice. This time around, I look at three small, integrated amplifiers—just what you need to make an affordable desktop audio system.

Orb Audio Mini-T

The most basic—and least expensive—model here is Orb Audio's \$118 [Mini-T Amplifier V2](#). (Despite the official price of \$118, Orb Audio seems to perpetually offer the Mini-T for \$69). Orb Audio's focus is on the company's spherical [Orb passive loudspeakers](#); the Mini-T is offered primarily as an easy way to turn a couple Orbs into a simple stereo-audio system. But the Mini-T works with passive speakers from any vendor, as long as they don't demand more power than the Mini-T can provide.



Orb Audio's Mini-T

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The Mini-T is a surprisingly light, glossy-black rectangular box—about the size of a small paperback book—with rounded ends. Its front panel features a volume knob that also acts as a power on/off switch, with a blue power LED that rings the volume knob. (The LED shines through the case, producing a subtle but cool effect.) The amp's back panel features spring-clip speaker terminals that accept bare wire or speaker cable terminated with pins; a jack for connecting the Mini-T to the supplied power adapter (a brick that weighs more than the Mini-T itself); a 3.5mm stereo-audio input, and a mono RCA output for use with [the company's subwoofers](#). The Mini-T's compact size and light weight are nice, but they do have one drawback: If your cables are on the stiff side, they can make it difficult to keep the Mini-T stationary.

Like the \$180 [Topping TP30](#) (3 of 5 rating) I previously reviewed, the Mini-T is built around a Tripath [Class T](#) amplification chip, similar to high-efficiency [switching Class D designs](#). Orb says the amp produces 10 watts per channel when connected to typical 8-ohm speakers.

Dayton Audio DTA-100a

Like the Mini-T, Dayton Audio's \$130 [DTA-100a Class-T Digital Mini Amplifier](#) is a Class T design. Also like the Mini-T, the DTA-100a seems to be perpetually discounted: It's [available from Parts Express](#), Dayton's official distributor, for



Dayton's DT-100a

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just \$89.

Though the DTA-100a is also a small black box, it's narrower and taller than the Mini-T, and noticeably heavier, due in part to its black, extruded-aluminum body and brushed-aluminum front and back plates. The look and feel of the case make it a substantial improvement on the Mini-T's plastic case.

The DTA-100a's front panel has a central volume knob that doubles as a power switch. To the left is a 1/4-inch jack for connecting headphones; doing so mutes output to the speaker outputs. To the right is a 3.5mm stereo-input jack for connecting an audio source. Unfortunately, the DTA-100a, like many other inexpensive electronic devices, sports an annoyingly bright blue power LED—bright enough to serve as a flashlight, or, unfortunately, a distraction.

The DTA-100a's back panel has a set of stereo RCA inputs for connecting an additional source. This input is intended for a permanently-connected source, while the front input is intended for temporarily connections—plugging a source into the front panel's input overrides the rear input. There's also a jack for connecting the included large power brick, and, of course, speaker connections. The speaker terminals accept only [banana-plug connectors](#), but these are included and relatively easy to install on standard speaker wire. The package also includes other useful extras such as a 3.5mm-to-3.5mm interconnect and a 3.5mm-to-stereo-RCA adapter for connecting audio sources, and a miniplug-to-1/4-inch adapter for connecting headphones. Dayton rates the DTA-100a at 50 watts per channel into an 8-ohm load.

Audioengine N22

At \$199, Audioengine's [Audioengine N22 Premium Desktop Audio Amplifier](#) is the most expensive unit here. It's also the biggest, offers the most features, and has the sturdiest construction. Audioengine markets the N22 for use with the company's \$249 passive [P4 Premium Passive Bookshelf Speakers](#), but, like all models here, it can be used with any set of passive speakers.



Audioengine's N22

The N22 is about twice the size of the DTA-100a and has an attached stand to position the unit vertically, which aids the N22's convection-cooling system (warm air rises out of the top of the unit, replaced by cooler area coming in from beneath). Although the N22 is larger and heavier than the other amplifiers—attributable at least in part to the quality of its components—this heft makes the amp substantial enough to stay in place, and its vertical orientation keeps its footprint small. The front of the N22 is relatively sparse, featuring a blue power LED (of reasonable brightness, thankfully) above a centrally located, solid-feeling volume knob that also serves as a power switch. Below the knob is a 3.5mm headphone jack, which will probably be more convenient for most users than the 1/4-inch jack on the DTA-100a. Connecting headphones mutes the N22's speaker outputs.

The back panel hosts a set of stereo-RCA inputs, a 3.5mm stereo input (which takes priority over the RCA inputs if you connect a source to each), a mono RCA output (with its output level tied to the N22's volume level, useful for adding a subwoofer), a connection for the substantial power brick, and a power-only USB port (for charging a smartphone or media player, or powering the company's [W3 Premium Wireless Audio Adapter](#), but not for audio input). Below the USB port is a set of binding posts for connecting speakers. The N22's speaker connectors are the sturdiest and most-versatile in this roundup: They can accept bare wire, pins, banana plugs, or spades.

Audioengine rates the N22's power output at 22 watts per channel into an 8-ohm speaker load. This may make the N22 seem less powerful than the DTA-100a, but based on weight, build quality, and manufacturer, I wouldn't be surprised to find that this difference is due to variations in measurement techniques. I suspect the N22 can actually produce more power than the DTA-100a. Notably, the N22 is based on a [Class A/B](#) amplifier design, which is less power-efficient than the Class T circuitry used in the other two amplifiers—hence the emphasis on airflow in the N22's case design. Proponents claim that Class A/B designs offer better sound quality than Class D or T amps. Are they right? Read on.

Testing, testing

I tested the three amplifiers as part of a desktop-audio setup. Specifically, for most of my testing I used my MacBook with a quality USB DAC (Audioquest's \$249 [DragonFly](#), slated for future review) to

ensure that I heard the limitations of the amplifiers rather than the limitations of my MacBook's audio output. The DragonFly's output was connected to the inputs of each amplifier as I tested it, while that amplifier drove a pair of Pioneer's shockingly good (but unfortunately named) [SP-BS22-LR bookshelf speakers](#) (\$130). The speakers were set up for desktop use on Audioengine's \$34 [DS2 Desktop Stands](#), which do a great job of improving the sound of bookshelf-style speakers on a desk.

I also spent some time testing the amps with the analog output of my MacBook as a source, and with the \$39 [HiFiMAN Express HM-101 Portable USB Sound Card](#)—a solid-but-affordable DAC and headphone amp.

When listening to the Mini-T with the DragonFly DAC and Pioneer speakers, I immediately noticed some harshness in high frequencies; and compared to the best performance I'd heard from the speakers, I noticed a decrease in bass performance (both in volume and tightness), detail, and the perceived



Pioneer's SP-BS22-LR

momentum of the music. Compared to more-expensive amps, the Mini-T's performance made music sound slightly more distant and veiled. This is relative, though, and I still enjoyed listening to the Mini-T-based system: The Pioneers still produced good sound with plenty of bass. The

Mini-T's volume knob also has a smooth feel and linear response—meaning that the volume level changes smoothly as you turn the knob, and that the left and right speakers stay in balance.

Overall, the Mini-T's performance is perfectly acceptable in light of its \$69 street price, and its 10 watts were capable of more volume than I needed in my small office (although the music started to take on a harsh edge when the amp was pushed to higher volume levels). If you don't listen too loudly, the Mini-T can also perform capably in a larger room, matching or exceeding the volume level of most inexpensive smartphone speaker docks.

After swapping cables to accommodate different speaker wire and input connectors, I fired up the DTA-100a, and I found a notable increase in performance. Bass tightened up and increased in volume, treble frequencies came into focus and lost some harshness, and midrange frequencies increased in detail and texture. The music's pacing also seemed to improve, likely due to better resolution of transients. Like the Orb, the Dayton did strain at higher volumes, with the music becoming increasingly harsh, but with the DTA-100a, such volumes were excessively loud in my desktop setup.

I did encounter a couple of issues with the Dayton's volume control. At lower levels, the volume didn't change as smoothly as it did with the Orb, sometimes dropping off suddenly—achieving a quiet level of playback took some finesse. And at these low levels, the stereo balance shifted noticeably to the left side, suggesting that the right side's output level was attenuated more quickly than the left side's. I didn't notice this at higher volumes, however, and this sort of issue is common in

inexpensive amplifiers. But if you have particularly efficient/sensitive speakers (in other words, speakers that can produce your desired listening levels without much power), or if you like to listen at very low volumes, it could be annoying.

Finally, I hooked up the Audioengine N22, and I heard the Pioneer speakers sound their best. Through the N22, bass was strong and tight, and high frequencies natural, without artificial harshness. When I pushed the N22 to louder volumes, it continued to perform well. In fact, when testing the N22 at loud volumes, I encountered the limitations of my listening setup—audible resonance from my desk—before I heard problems with the amplifier itself. Unless you're using substantially bigger speakers in a large room, or need extremely loud volumes, the N22 will likely provide plenty of power. One minor complaint is that the volume knob feels a little loose; it could benefit from more friction.

Further comparisons

The three models here are similar in size and capability to several of the [DAC-endowed models I previously reviewed](#). To put the performance of these DAC-less models into perspective, I compared the DTA-100a to the \$180 Topping TP30, and the N22 to the the \$229 [NuForce Dia](#) (4 of 5 rating) and its discontinued \$349 sibling, the [Icon-2](#) (3.5 of 5 rating).

Listening to the headphone output of my MacBook connected to the DTA-100a and the TP30 (specifically, to the latter's analog input), the DTA-100a is a clear upgrade over the TP30, producing tighter bass and a less-crowded sound that enables each instrument and voice to better stand on its own.

However, when I connected the TP30 to my MacBook via USB to take advantage of the TP30's built-in DAC, the two amps were more evenly matched. The TP30 still sounded a little crowded, but its bass tightened up and it offered improved midrange detail. I give a slight edge to the TP30, taking into account its DAC and amplifier, but the DTA-100a is still the better *amplifier*, and the DTA-100a represents a better option if you already have a high-quality source, or if you're using an analog-only source.

I wanted to perform a similar experiment to compare the Audioengine N22 to the NuForce Dia, but that's not quite possible, as the Dia doesn't have analog inputs. However, NuForce's Icon-2 features essentially the same amplifier, so I brought it into the mix as well. As expected, the Icon-2 (through its analog inputs) sounded great, with tight bass and a sound that gave each instrument some space to breathe. The N22 was even better, though, with more clarity, space, and instrumental detail, along with tighter bass.

Switching to the Icon-2's USB input put it more or less on par with the N22. There were some subtle differences in sound, but overall performance was comparable. It wasn't until I switched to the NuForce Dia (connected to my MacBook's optical output), with its better DAC, that I heard something that bettered the N22, justifying the Dia's \$30 price premium. However, pairing the N22 with a quality standalone DAC (the DragonFly) offered even better performance, suggesting that the N22 includes the best amplifier of the bunch.

Headphoning it in

Both the DTA-100a and N22 include headphone jacks; I tested each with my [AKG K 701](#) headphones (which are picky about amplification) to see if either is of sufficient quality to replace a dedicated headphone amplifier such as the the modest HiFiMAN Express HM-101. I used the HM-101's DAC as a source to feed the two amplifiers, and I also used the HM-101's headphone output to provide a benchmark for evaluating the headphone outputs of the two amplifiers.



AKG K 701

The contest between the HM-101 and the Dayton DTA-100a produced mixed results. The DTA-100a pulled better bass performance out of the headphones, but I found that the HM-101 sounded less harsh and more pleasant overall. (Both improved on my MacBook's built-in headphone jack, however.) In other words, the DTA-100a's headphone jack is on par with that of an inexpensive headphone amplifier. In contrast, I preferred the N22's headphone jack to that of the HM-101. The N22 offered more bass, better pacing, more detail, and an overall more-enjoyable listening experience. If you've already got a good headphone amplifier, you'll likely want to continue to use it, but the headphone jacks on both units are a nice bonus if you've been using a standard headphone jack.

Bottom line

I'm comfortable recommending any of the three amps here; I suggest going with the amplifier that's best for your budget and speakers. If you want to get up and running as inexpensively as possible, the Orb Audio Mini-T will do a fine job of bringing your old speakers back to life. But for not much more money (\$20 at current street prices), the Dayton Audio DTA-100a offers a notable improvement in audio quality, two inputs, and a pretty good headphone jack. The problems I encountered with stereo balance at low volumes were disappointing, but I suspect they won't be issues for most people, and I think the DTA-100a is the overall better value. If you're planning to use a computer as a source, though, you should consider the previously reviewed Topping TP30 and its built-in DAC.

For a bit more money, the Audioengine N22 offers the best construction of the three units, and by far the best sound—if you've spent \$200 or more on your speakers, the N22 will help them sound their best.

However, the N22 is also the same price as some entry-level stereo and home theater receivers, which will offer many more features but take up substantially more space. The N22 is also very close in price to NuForce's great \$229 Dia, which adds digital inputs and a remote (but omits analog inputs). If your equipment has questionable analog outputs but coaxial- or optical-digital outputs, I recommend the Dia over the N22. With a quality analog-audio source, however, the N22 shines, and is the best desktop amplifier I've heard.

Orb Audio Mini-T Amplifier V2



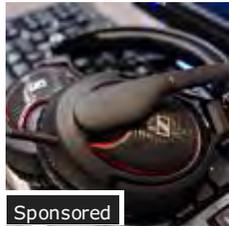
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